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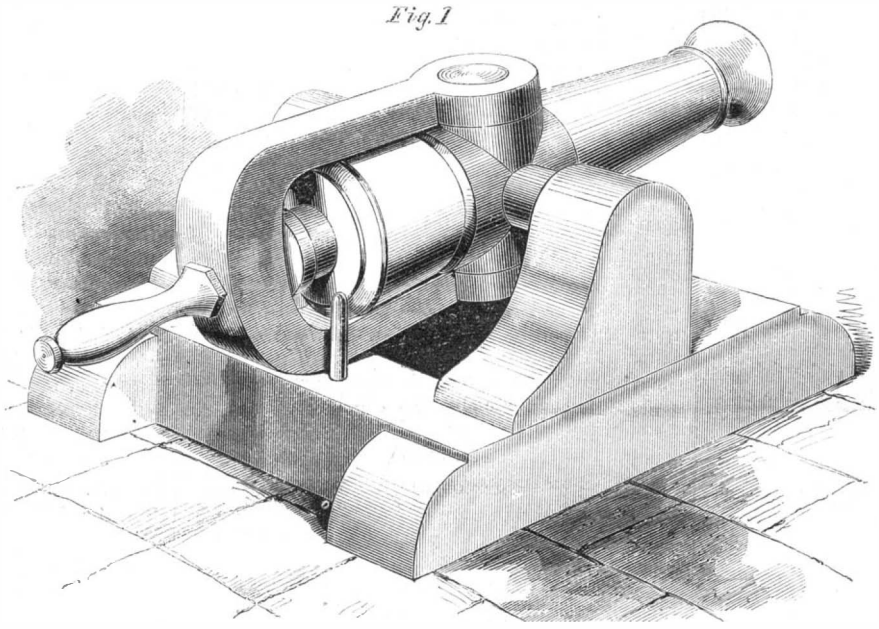
Improved Breech-Loading Cannon.

We had pretty nearly come to the conclusion that no breech-loading cannon would ever be contrived that would overcome the great objections that exist to making heavy guns of complicated construction; but in mechanism it is never safe to say that anything cannot be done, however difficult it may appear; and we begin to have faith in the practicability of cannon to be loaded at the breech. We here illustrate a new invention in this line, made by George B. Brayton, of Providence, R. I., which seems to us as likely to bear the test of experiment as any one that we have yet examined.

The massive loop of iron, A, Fig. 2, is secured to the gun by large trunnions placed perpendicularly to the ordinary trunnions, so that the loop may be swung around horizontally either directly behind the breech or to one side. A movable breech-pin, *b*, is fitted to slide easily into the breech, and after the cartridge is introduced the pin is put into its place and the loop is swung behind it to hold it against the force of the explosion.

For firing the gun, a small hole is bored through the axis of the breech-pin, and in this a rod, *c*, is fitted to slide freely. Directly behind this rod is the spindle, *d*, passing through the loop, A, and through its handle, with a milled head upon its outer end, and a spiral spring to press it forward. A little percussion powder is placed in the rear end of the cartridge, and the gun is discharged by pulling back the spindle, *d*, and letting it fly forward, driving the rod, *c*, against the percussion powder, thus firing the cartridge. The loop, A, is then swung out of the way, the breech-pin withdrawn, and a second ball and cartridge are introduced through the breech.

Fig. 1



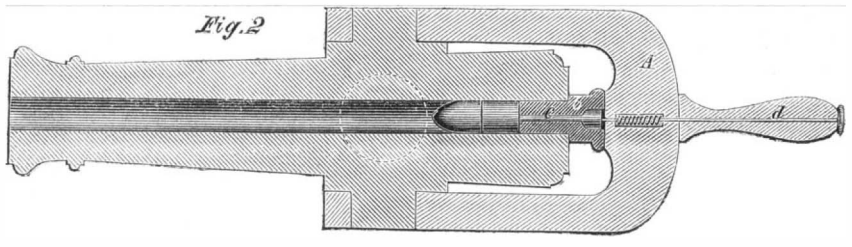
BRAYTON'S IMPROVED BREECH-LOADING CANNON.

The advantages claimed for this gun are :—

1. The unobstructed opening through it allows a circulation of air which keeps the piece cool, even in rapid firing.

2. The peculiar simplicity of its arrangement permits sufficient strength in the parts to render the weapon safe to its operators, thus overcoming the great objection which has been urged against breech-loading cannon.

Fig. 2



3. The ease with which it can be operated; only two men being required to load and fire it as fast as is permissible on account of heating.

4. It can be used with either loose or fixed ammunition.

5. The simplicity of its construction enables it to be made in any ordinary machine shop.

6. In case of probable seizure by the enemy, it can be rendered useless to them by carrying off the breech-pin.

The gun, in service, will be mounted in the ordinary way; our engraving represents the temporary frame of a small model.

Further information in relation to this invention may be obtained by addressing the inventor, George B. Brayton, at Providence, R. I.

The Muzzles of Rifles and Rifled Cannon.

In guns intended to throw acorn-shaped shot, there is no part which requires to be more nicely finished than the muzzle. Of all the rifles ever invented, none have surpassed in accuracy at long range, the false muzzled rifle invented by Clark, and we have never seen accounts of practice with any other that was equal to his. The object of Clark's invention was to obtain and preserve a perfectly finished muzzle. To accomplish this, he sawed off about two inches of the end of the gun, and this piece is secured in its place while the gun is being wiped out and loaded, and is then removed before the gun is discharged. The piece is secured precisely in place by dowel pins. Before it is sawed off, four holes the size of medium wire are drilled lengthwise into the end of the gun to the depth of about three inches, and after the piece is removed, wire pins are secured in the holes in the piece, protruding about one inch downward, so that when they are driven into the corresponding holes in the end of the rifle, the piece occupies exactly the position that it did before it was cut off. The rifle is contracted slightly at the muzzle, so that it is necessary to drive the shot in with a brass cylinder and a mallet; the cylinder, of course, having a conical cavity in its lower end to fit the point of the acorn-shaped shot. After the shot is driven in about four inches, however, the wooden ramrod is introduced, and a very slight force slides the shot down the smoothly polished barrel. This false muzzle, of course, protects the muzzle of the rifle from wear, and preserves always a perfectly square, sharp corner.

Rifles under Clark's patent have been manufactured by Wesson, of Massachusetts, and James, of this State. The writer of this had one made to order by Wesson, and it was a most perfect gun for target practice. Wesson made all of his barrels of drilled cast steel, and they were as perfect as anything that has ever been constructed by the fingers of man. By running a piece of white cotton a couple of inches down the bore, the finish of the inside could be seen, and it was as smooth and polished as metal could be made. Wesson tried each of his rifles by screwing it into a wooden vise and firing it twenty times at a target, and if all the shot did not enter the same hole, the gun was not permitted to leave the shop.

The usual distance for shooting at turkeys now in New England is eighty rods (just a quarter of a mile), and at this long range any slight imperfection in the rifle is more perceptible than at shorter distances. We have been assured by a man who has spent his life in making and shooting rifles, that he could detect a wear in the muzzle by the deviation of the shot sooner than he could by any measurement or observation of the muzzle itself.

It is probable that this great perfection of the muzzle is more important for elongated missiles than it is for round balls; as a slight turning of the shot by the gases escaping on one side of the base before they do on the other side, would cause the long missile to deviate by the resistance of the atmosphere.

As it is the process of cleaning and loading the rifle which wears the muzzle, of course there is no difficulty in preserving the muzzles perfect of breech-loading rifles. But, so far as we are aware, no breech-loading guns have ever equaled in accuracy the muzzle-loaders of Wesson and James. This is probably owing to the fact that the points of the conical shot are not secured precisely in the center of the bore. This is a point worth the attention of inventors. In Colt's revolver, as the shot is forced down from above, in the same way as loading at the muzzle, there is no difficulty in securing the point of the shot precisely in the middle of the bore; and if there is any other breech-loading rifle that shoots with the accuracy of Colt's, we have not chanced to see it.

The importance of nicely-finished muzzles for cannon has not attracted a large share of the attention of artillerists, but with the introduction of elongated shot, it can hardly be overlooked. We are inclined to the opinion that the unparalleled accuracy of the Armstrong gun is attributable to the perfection of the muzzle, rendered possible by the loading being done at the breech. Can the muzzles of muzzle-loading cannon be secured in any way from wear in loading? If so, it is important that it should be done.

THE greatest span of suspension bridge yet completed in America is that by Mr. E. Serrell, C. E., of ten hundred and forty-three feet, over the Niagara river at Lewiston.

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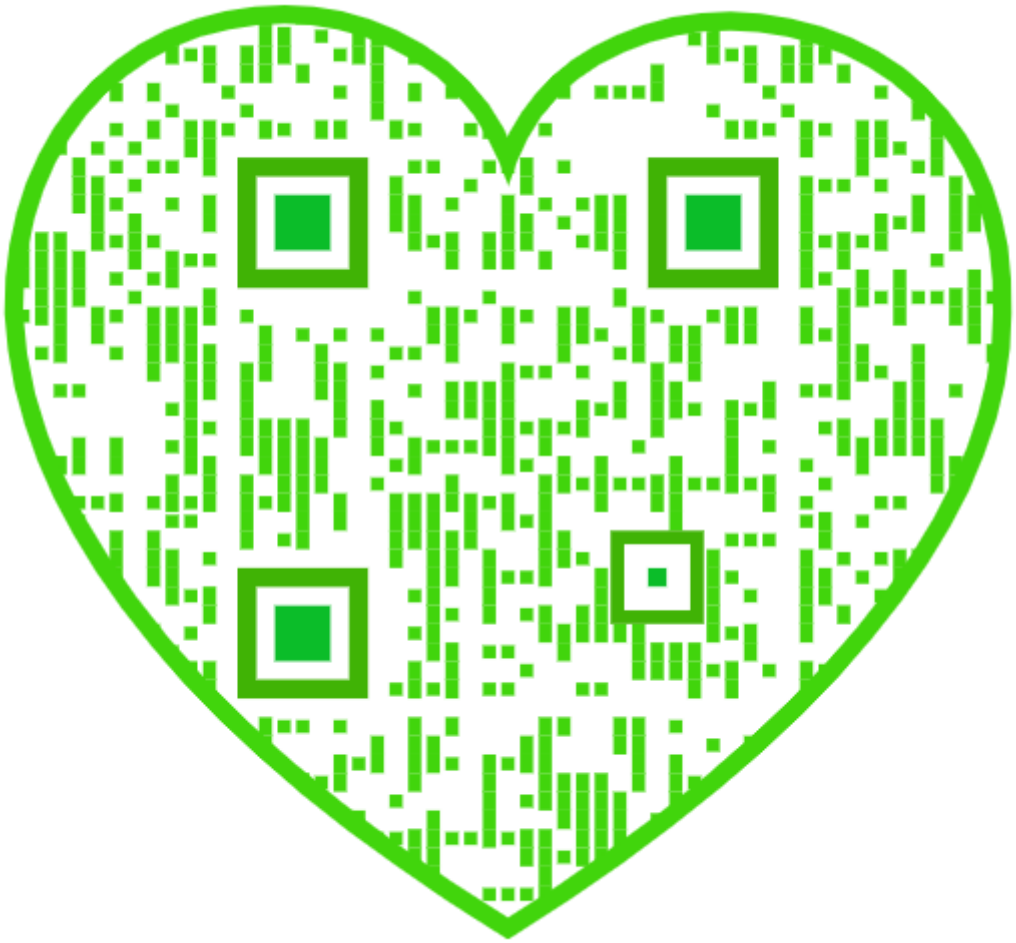

CHANGE OF MAIL DAY.

With a view of presenting the latest intelligence from the seat of war, we shall hereafter mail the SCIENTIFIC AMERICAN on Friday instead of Tuesday. By this change the SCIENTIFIC AMERICAN will have as late war news as any other weekly paper.

It is the intention of the publishers to keep up with the times, in news and in illustrations of new inventions pertaining to warfare, and at the same time, illustrate and describe all new inventions and discoveries which may be considered important in any department of mechanics or science. The publishers trust that all subscribers whose term for which they prepaid are about expiring, will renew their subscriptions.

THE WAR.

THE MILITARY OCCUPATION OF BALTIMORE.

No other event has yet occurred so well calculated to give the country confidence in the plans of General Scott and the Cabinet, and in their ultimate success in suppressing this great insurrection, as the result of their management of Baltimore. By careful forbearance, combined with the exhibition of irresistible power they have so completely assured the Union party and smothered the secession element, that when the time arrived for marching the troops into the city, they were received by the citizens with every manifestation of the most friendly welcome.

The American flag was everywhere displayed from the house tops, balconies, stores and dwellings; parties of young ladies walked along Baltimore street waving the Stars and Stripes, and companies of volunteers marched with music and the same flag. The operation was made by order of General Scott, on the evening of Monday, May 13th. About eight o'clock a large train, filled with troops, arrived at the outer depot from the Relay House, containing one thousand troops, taken from each of the regiments stationed at that post. The Sixth Massachusetts and Eighth New York regiments, with a battery of artillery, marched through South Baltimore to Federal Hill, a high point of ground, on the south side of the harbor, directly overlooking the city, and one mile west of Fort McHenry. The sudden appearance of the troops took the citizens by surprise. They were greeted with every demonstration of approbation, and immense crowds eagerly gathered, cheering at every step, ladies waving their handkerchiefs, and many brought lamps and candles to the windows. Prominent citizens accompanied the troops to the hill and assisted the officers in taking the best route thither and procuring quarters for the troops until tents could arrive. The troops seemed to be highly pleased with their reception, and all expressed surprise and delight at the commanding position and fine prospect, with the whole city and country spread out before them.

The army of occupation, now in Baltimore, is commanded by General Cadwallader, of Pennsylvania, General Butler having been promoted to the rank of Major-General, commanding at Fort Monroe.

THE ARREST OF ROSS WINANS.

On Tuesday the 14th of May, Ross Winans, Esq., the millionaire, who made a great fortune by his contracts in Russia, and who has been widely known in connection with his cigar-shaped steamer, was arrested while on his way from Frederick, where he had been attending the session of the legislature. The arrest was made by an order issued from the head quarters of the War Department, and is supposed to have relation to the connection of Mr. Winans with the secessionists. The following is the Baltimore *American's* account of this occurrence:—

As the members of the Legislature, which adjourned yesterday, were returning to Baltimore in an extra evening train, it stopped a few moments at the Relay House, when an officer entered the cars and approached Ross Winans, Esq., one of the members of the House of Delegates from Baltimore city, and courteously inquired if he was Mr. Winans. Receiving an affirmative reply, the officer said he wished to speak with him. Mr. Winans asked him what it was, and the officer said he had an order for his arrest.

Mr. Winans was then politely assisted from the cars and across the railroad track to an office in the depot, before the door of which a guard was immediately placed. Members of the Legislature rushed from the cars, and asked the cause of his arrest and to be permitted to see him, but no one was allowed to enter except Governor Hicks, who was present.

The Governor soon returned, and stated that no satisfaction was given him as to Mr. Winans' arrest, and that all offers of security for his appearance to-day were refused. He also stated that he was assured that Mr. Winans would be comfortably cared for until the examination took place. Mr. Winans was arrested, it was said, by order of General Butler. The train left for Baltimore in a few minutes, the members of the Legislature on the train manifesting much excitement at the event.

Upon hearing of his arrest, several of his friends proceeded to Washington, for the purpose of ascertaining the charge against him, and, if possible, to obtain his release. It was learned that the charge was that he had given aid to Virginia, by furnishing grape shot, &c. The utter fallacy of this was at once made apparent to the President, when he directed General Scott to issue an order for his unconditional release. The order was immediately sent to Fort McHenry, where Mr. Winans was under arrest, and he was at once released and returned to his family. The order to arrest Mr. Winans was not issued by General Butler, but came from headquarters, and was addressed to all commissioned officers. It may not be generally known that, although Mr. Winans is an old resident of Baltimore, he is a native of New Jersey.

THE POSITION OF MARYLAND.

The Legislature of Maryland adjourned on the 14th of May without passing any act of secession. They, however, appointed peace delegates to what they called the "Southern and Northern confederacies." They are to meet again on the 4th of June.

After the adjournment of the legislature, on the evening of the same day, Governor Hicks issued his proclamation calling out Maryland's quota of militia under the proclamation of the President of April 15th. Governor Hicks's proclamation recites an assurance of the Secretary of War that the Maryland troops shall be employed only within the limits of the State of Maryland, or for the defense of the capital of the United States. It seems, however, that the Secretary of War has declined to accept the four Maryland regiments offered by Governor Hicks simply for the defense of that State and of the District. The Governor has misapprehended the tenor of the Secretary's explanations, and if the Marylanders enlist they must enter the general service.

General Cooper, of Maryland, is raising a brigade to comprise not more than five nor less than three regiments. He has three already formed, and is actively engaged in getting them ready to march whenever they shall be ordered for service.

THE UNION MEN OF WESTERN VIRGINIA.

In the convention at Wheeling of the Union men of western Virginia a proposition was introduced by Mr. Carlile to divide the State, separating the western free portion from the eastern slaveholding, calling the western New Virginia. The proposition was voted down, 16 to 6, but the matter was referred to another convention to meet at the same place on the 11th of June, when the vote of the people on the secession ordinance will be known. The convention passed a resolution declaring it to be the duty of the people of Virginia to support the constitution of the United States, and adjourned on Wednesday the 15th of May.

GENERAL HARNEY IN MISSOURI.

The important command of the United States forces in Missouri has been conferred on Brigadier-General Wm. S Harney, of the regular army. He is a man as little given to standing upon ceremony as Napoleon Bonaparte. The Governor of the State is a secesssionist, as well as a majority of the members of the Legislature, and under the excitement of the capture of secessionists mentioned in our last issue, a military bill was passed which amounted to an act of secession. General Harney promptly issued a proclamation annulling the act. He says:—

This bill cannot be regarded in any other light than an indirect secession ordinance, ignoring even the forms resorted to by other States. Manifestly its material provisions are in conflict with the constitution and laws of the United States. To this extent it is a nullity, and cannot and ought not to be upheld or regarded by the good citizens of Missouri. Disclaiming, as I do, all desire or intention to interfere in any way with the prerogatives of the State of Missouri, or with the functions of its executive or other authorities, yet I regard it as my plain path of duty to express to the people, in respectful but at the same time decided language, that, within the field and scope of my command and authority, the "supreme law" of the land must and shall be maintained, and no subterfuges, whether in the forms of legislative acts or otherwise, can be permitted to harass or oppress the good and law-abiding people of Missouri. I shall exert my authority to protect their persons and property from violations of every kind, and I shall deem it my duty to suppress all unlawful combinations of men, whether formed under pretext of military organizations or otherwise.

A gentleman of St. Louis, Mr. Thomas T. Gannit, wrote to General Harney, asking him if it is the intention of the United States government to interfere with slave property in any way. In the course of his reply, General Harney uses the following language:—

I am not a little astonished that such a question could be seriously put. Already, since the commencement of these unhappy disturbances, slaves have escaped from their owners, and have sought refuge in the camps of United States troops from Northern States, and commanded by a Northern General. They were carefully sent back to their owners. An insurrection of slaves was reported to have taken place in Maryland. A Northern General offered to the Executive of that State the aid of Northern troops under his own command to suppress it. Incendiaries have asked of the President permission to invade the Southern States, and have been warned that any attempt to do this will be punished as a crime.

MORE MISSOURI SECESSIONISTS CAPTURED.

Several Union men having been driven from Potosi, on the Iron Mountain Railroad, a detachment of volunteers, under command of Captain Cole, was sent on Tuesday night, May 14th, to protect the loyal citizens in that section. Captain Cole reached Potosi at three o'clock on Wedneday morning, and surrounded the town with a chain of sentinels, and shortly after daylight a hundred and fifty citizens were taken prisoners and formed in line. The Union men were recognized and released. About fifty secessionists were liberated on parole, and nine of the leaders were brought to the city of St. Louis prisoners of war. A lead manufactory, belonging to John Dean, was taken possession of, and some four hundred pigs of lead seized. On the return trip the troops dispersed a company of cavalry at De Soto, and captured thirty horses they left behind in their flight. The Stars and Stripes were then hoisted on a pole just ready to receive a secession flag. Another prominent secessionist was arrested here, and another at Victoria, making twelve in all, who are now in the arsenal.

THE BLOCKADE.

The blockade of the Southern ports is being rapidly organized. Already all the ports of Virginia, as well as Charleston, S. C., and Pensacola and Key West, Fla., are guarded by ample naval forces. Several vessels have been seized in attempting to leave the blockaded ports, and those attempting to enter are ordered away. The steamer *Niagara* is stationed off the port of Charleston.

The Charleston *Courier* reports that on the 12th ult. the British bark *Hilja* was refused entrance into the port by the *Niagara*. The British ships *Monmouth* and *General Parkhill* were also ordered off. The British ship, *A and A* was pursued, but ran into shoal water and was towed up to the city. The British ship *Susan G. Owens*, for Liverpool, was boarded, but finally allowed to pass.

Among the vessels seized is the famous slave yacht *Wanderer*, which was taken possession of by the United States steamer *Crusader*, at Key West, on the 5th of May.

Annexed are the names of the vessels, with armaments on board, which have been commissioned to guard the different ports. None of the regular vessels ordered are inserted except those on active duty or almost ready for their cruise:—

REGULAR MEN-OF-WAR.

	VESSELS.	TUNS.	CREW.	GUNS.
Steam frigate	Minnesota	3,200	500	40
"	Niagara	4,580	500	12
"	Wabash	3,200	400	44
"	Powhattan	2,415	400	10
St'm corvette	Brooklyn	2,075	325	14
"	Mississippi	1,692	300	11
St'm gunboat	Pawnee	1,289	100	6
"	Pocahontas	330	95	4
"	Wyandotte	380	110	6
"	Crusader	549	110	8
"	Mohawk	464	110	6
"	Waterwitch	378	94	5
Sail, frigate	Sabine	1,726	500	50
sloop	Cumberland	1,726	332	24
"	St. Louis	700	300	20
brig	Bainbridge	400	100	6
corvette	Vandalia	783	260	20
brig	Perry	280	100	6

IRREGULAR AND CHARTERED VESSELS.

	VESSELS.	TUNS.	CREW.	GUNS.
Steamer	Harriet Lane	300	94	4
"	Corwin	260	80	4
"	Bibb	320	83	4
"	Vixen	360	90	3
"	Monticello, about	400	35	4
"	Quaker City	unknown	38	3
"	Huntsville	"	35	3
"	Keystone State	"	100	3
"	Mount Vernon	"	70	
"	Dawn	"	30	
"	R. R. Cuyler	"	30	
"	Montgomery	"	30	5
"	Daylight	"	34	2
"	Resolute	"	20	1
"	Reliance	"	20	1
"	South Carolina	"	30	unknown.
"	Massachusetts	"	30	"
"	Freeborn	"	30	2
"	Young America	"	30	2
"	Maryland	"	unknown	unknown.
"	Uncle Ben	"	15	2
Total			5,550	354

To form an idea of the extent to which this fleet increases the fighting material of the service, it should be borne in mind that we have never before had more

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than 40 ships and 7,000 sailors in commission, in the entire navy.

The Norfolk and Chesapeake naval guard being the only one which has taken shape, we give it, as follows;—Steam frigate *Minnesota*, corvette *Cumberland*, steamers *Pocahontas*, *Young America*, and *Harriet Lane*, and three others.

The harbor of New York is carefully watched, to prevent vessels conveying arms, ammunition, or provisions to the disloyal States, and to arrest such ships as might be suspected of privateering purposes in the interest of the Southern confederacy. The steamer *Vixen*, at Throgg's Neck, commands the egress from Long Island Sound; the *Corwin*, the entrance to the ocean at the Narrows; and the *Bibb*, at the mouth of the Kill von Kull, all the outlets in that vicinity.

On the night of the 14th ult., the gunboat *Quaker City* towed to sea ship *Arago*, of Bath, Maine, with a cargo of tobacco from Richmond, Va, valued at $150,000. There was a prize crew placed on board by Commodore Stringham of the squadron, her destination being New York.

THE DESTRUCTION OF A SECESSION BATTERY.

On Saturday, May 18th, a secession battery at Sewell's Point, Va., which threatened to interfere with the blockade of James River, was attacked, and its cannon dismounted by two United States war vessels. The battery in question is the eighth and last of the important works which defend the approaches to Norfolk, all now in the hands of the secessionists. The one nearest to Norfolk mounts eighteen guns; the second, Fort Norfolk, has twelve guns; next, Craney Island, mounts thirty guns, while below there are two others, one of seven and the other of ten guns, all splendidly built, and mounted with the best heavy rifled and other ordnance from Norfolk Navy Yard, the least part of which was destroyed in the partial fire. The heaviest of Dahlgren's rifled ordnance were at that yard.

The United States steamer *Star* (late *Monticello*), at noon, commenced cannonading the new work. She fired shell with 10-inch guns, which burst with effect. Commander Ward's flotilla arrived from New York at two o'clock. Captain Ward, in the steamer *Freeborn*, was immediately sent to aid the *Star*. The *Freeborn* opened with 32-pound round shot. She fired fifteen rounds, and drove out the engineering or defending party, commanded by a mounted officer. She then hauled off and reported to the Commodore, who despatched the *Freeborn* immediately for Washington.

CAPTURE OF SECESSIONISTS ON THE POTOMAC.

The *Freeborn*, on her way up the Potomac, while lying to in a fog on Sunday evening, May 19th, observed a small schooner which attempted to pass after being hailed repeatedly. At the threat of a shot the captain let go her anchor. He reported that she was a fisherman, bound to Alexandria, and had two passengers for that place. By daylight it was found her hold was crowded with men, fifty being counted on deck at once. She was brought to Washington and anchored under the guns of the Navy Yard. The men said they had been offered $13 per month to serve in the secession army. The captain said they were fishermen of Baltimore, going home *via* Alexandria. They are said to be a very hard looking set.

CAPTURE OF A PRIVATEER.

A dispatch to the New Orleans *Picayune*, by the Belize line, says the privateer steamer *Calhoun* captured on the 15th ult. the bark *Ocean Eagle*, Captain Luce, from Rockland, Maine, with 3,144 casks of lime, consigned to Creevy & Farwell, of that city.

SEIZURE OF TELEGRAPHIC DISPATCHES.

The government, having cause to suspect that unknown persons in the North were furnishing arms to the secessionists, and otherwise aiding them, determined to seize all the telegraphic dispatches which had been accumulating in the offices for the past year, in order to detect the traitors. Secret orders were accordingly sent to the United States Marshals in the several cities to make the seizure at the same hour, at 3 o'clock in the afternoon of Monday, May 20th. The orders were ably and successfully executed, and an immense number of dispatches obtained. Those in this city are said to amount to 255,000. Officers are to examine and assort the messages, and all private dispatches are to be held sacred.

THE SITUATION ON MAY 22D.

The government is concentrating troops at three points on the borders of the Southern States—Cairo, Washington and Fortress Monroe, at the mouth of the Chesapeake—and it is thought that, as soon as the force at Washington is sufficiently powerful, an advance will be made from that point into Virginia.

From all parts of the South, we hear of the most active military preparations and the movement of troops, generally toward Washington or Richmond. At Harper's Ferry is a large body, the numbers being variously reported, but probably amounting to 8,000 men. Troops throughout the North are being pressed upon the government with such zeal and earnestness that the only embarrassment arises from the jealousy caused among those who are rejected. Thus, both parties are gathering their forces toward each other, and all are looking for a great battle somewhere in Virginia.

THE ATTACK ON THE STEAMER "BALTIMORE."

On the night of the 19th of May, the steamer *Baltimore* got aground at the mouth of the Potomac. A propeller, armed with a heavy gun and full of men, attacked her there, and out of twenty on board the *Baltimore*, four were killed and five mortally wounded. Two of those killed were Cole and Lieutenant Denice, of Company D, and Greenough, of Company G. Whelpley, of Company D, was mortally wounded, and so were Thall and Ferguson. Three others were slightly wounded by splinters. The *Baltimore* guard fought like men, and the steamer's side was covered and her decks slippery with blood, and strewn with splinters. The secessionists had a heavy gun and fired grape and canister; they numbered at least one hundred men. Sergeant Wolcott, of Company D, lost his right eye. The *Baltimore* was not taken. This fight was reported on the 20th, then contradicted, and is again given in the New York *Herald* of the 22d ult., with the above particulars.

CALIFORNIA FOR THE UNION.

The telegram to the Associated Press, of May 11th, received by overland express from San Francisco, says:—

The Union demonstration in San Francisco to-day is an astonishing success. Nothing like it was ever seen here before. Business is totally suspended; all the men, women and children of the city are in the streets, and flags are about as plenty as stacks of grain in a wheat field. Three stands for speakers are erected near the corner of Market, Second and Montgomery streets, which are surrounded by men, with fields of flags waving over them.

Senators Latham and McDougall, General Sumner, General Shields, and others of less note have addressed the vast audiences. The spirit of all the addresses, as well as of the resolutions adopted, is that the administration must be sustained in all its efforts to put down secession and preserve the Union complete.

A procession moved through the principal streets, composed of thousands of men, on horseback, in carriages, and on foot, and embracing all the military and civic organizations of the city. All political parties joined in the demonstation, and the outward signs are that San Francisco is unanimously for the Union and the support of the government.

A telegraphic despatch from Los Angeles states that a bear flag was raised in Elmonto on Sunday last, by a band of forty mounted men, probably from Texas, as emigrants from that State have always composed a large portion of the population of the southern counties of this State. Not much importance is attached to this small rebellion—the first demonstration of the kind that has occurred on this coast, and probably destined to be the only one.

The "Scientific American" Among the Soldiers.

In our last issue, we stated that for some weeks previous we had been distributing our paper among the soldiers at the Barracks in this city, and proposed to extend the circulation to the different regiments in other parts of the country.

By the courtesy of Mr. Hoey, of Adams Express Company, who kindly volunteered to forward the parcel to the army free of expense, we circulated over 500 copies of our last issue. The officers of several of the regiments have acknowledged the receipt of the paper; and that other publishers may be induced to follow our example, we publish the annexed letter from one of the regiments, as an evidence that such favors are appreciated by the officers and soldiers:—

WASHINGTON, D. C., May 18, 1861.

MESSRS. MUNN & CO.:—Your kind favor of the 16th inst. has been received, concerning twenty copies of your paper, which I have taken great pleasure in distributing among the companies of our regiment, mentioning, at the same time, your offer to send us the same number of copies weekly. I need not tell you how acceptable they will be. While thanking you in the name of the regiment, I remain, gentlemen, very respectfully,

H. S. FEARING,
R. Q. M. Fifth Regiment N. Y. S. M.

Let all the publishers of newspapers in New York, Philadelphia and Baltimore send a few hundred copies of their papers every week to the army, and our patriotic soldiers will bless them for the favor.

A Confederate Commissioner Seeking Government Protection.

The Paris correspondent of the Mobile *Register* says:—"I have seen reference made in various journals of the United and Confederate States, to the visit to Paris of the Hon. Thomas Butler King, of Georgia, formerly a distinguished member of the Federal Congress, reported to be charged by the new republic with a commercial mission to the French government. Mr. King has been sojourning in Paris for some time, and left this capital a few days ago for Brussels. At the moment of his departure he found it absolutely necessary to obtain a passport but naturally felt great delicacy in demanding one from the only source to which he could apply. Mr. Faulkner, however, unhesitatingly furnished the requisite document, recognizing in Mr. King the full qualities of a citizen of the United States."

Certainly Mr. King is regarded as a citizen of the United States, and by accepting the passport guaranteeing his safety, he acknowledges himself to be such. Yet under the protecting shield of a United States passport, Mr. King is traversing Europe to obtain advantages for a provisional government that seeks to overthrow the very power that throws its wing over him. Verily, this is magnanimous!

Armstrong Guns and Enfield Rifles.

We have seen it stated in several papers that an Armstrong rifled gun, imported from England, was used against Fort Sumter. Now, this is a mistake; Armstrong guns are manufactured exclusively for the British government, and cannot be sold to private parties. It was an English (Blakely) rifled cannon imported from Liverpool that was used at Charleston.

We have also seen it stated in several papers that Enfield rifles, purchased in England, have arrived here for arming our volunteers. This is also a mistake. The rifles made at Enfield are all for the British army, because the works belong to the government. Such rifles cannot be sold to private parties, nor obtained upon any account from England. The British rifled muskets that have been imported are equally as good as those made at Enfield, because they are similar in pattern, though they are manufactured by private gunsmiths.

ARRIVAL OF ARMS.—The steamship *Arabia*, now in port, brought over 10,000 English rifles, being a portion of the order of the government for arms from England. The Governor of Massachusetts has sent over an experienced Board to purchase arms to the extent of $250,000. The Governor of this State has dispatched an agent from the city of New York, under the auspices of the Secretary of State of the United States to the British government, for the purchase of arms, and $500,000 have been set apart for that purpose, of the three millions appropriated by the State Legislature for war purposes. In case they cannot be purchased in England, or loaned there, with a pledge to return an equal number as good, giving the half million as security, they will then be purchased in Belgium, where there are large manufactories and usually a large surplus supply.

RAILROAD BATTERY.—In a recent issue, we gave a description of a novel railroad battery built in Philadelphia. We learn from an exchange that it has been sent to Bush river, near Baltimore. It consists of an ordinary baggage car of the greatest possible width, the sides, ends and roof being constructed of pieces of wrought iron, overlapping each other in such a manner as to resist everything but cannon balls. Minié balls fired at it from the most favorable position only make a dent in the iron, and cannot penetrate it. The armament of the battery consists, in part, of fifty Minié muskets and of a rifled cannon of long range, mounted on a turn-table, from which it can be fired in any direction. It is said that there are some other things about the battery which prudence requires should not be mentioned. It is represented to be one of the most destructive engines of modern warfare.

THE VETERAN CASS.—A correspondent of the Philadelphia *Press* says:—"I learn that General Cass is resolved, even in his old age, to die with harness on his back, and has mounted his old uniform and reviews his troops, now congregated in Detroit, every morning. He has contributed out of his private fortune $25,000 to the equipment of the Michigan volunteers and $10,000 to the support of their families during their absence."

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UNION AND SECESSION.

A few of our readers at the South are making themselves uncomfortable over our support of the Federal government in this crisis of its history. They seem to think that we are vile abolitionists because we uphold the Union and the Constitution against secession. We profess not to have studied political science very much, but we have had no occasion to desire the breaking-up of our Union, and have a sort of common sense opinion that secession is illegal.

Mr. Jefferson, in his inaugural address in 1801—the sentiments of which he repeated in 1805—made use of the following expressions :—

The preservation of the general government in its whole constitutional vigor, is the sheet anchor of our peace at home and safety abroad ; absolute acquiescence in the decisions of the majority, the vital principle of republics, from which there is no appeal but to force, the vital principle and immediate parent of despotism.

In 1787, Mr. Jefferson wrote :—

When two parties make a compact, there results to each a power of compelling the other to execute it.

After the election of Mr. Madison, the electors of Virginia, the Madison corresponding committee, and the Governor of the State dined together in Richmond. The following was the fourteenth regular toast :—

The Union of States: the majority must govern: it is treason to secede.

General Jackson, who was generally esteemed a patriot in his day, says, in his message of January 16, 1833 :—

The right of the people of a single State to absolve themselves at will, and without the consent of the other States, from their most solemn obligations, and hazard the liberties and happiness of the millions composing this Union, cannot be acknowledged. To say that any State may, at pleasure, secede from the Union, is to say that the United States is not a nation.

In a message to Congress, dated August 20, 1844, John Tyler, then President of the Union he is now willing to see destroyed, says :—

I regard the preservation of the Union as the first great American interest. I equally disapprove of all threats of its dissolution, whether they proceed from the North or the South. The glory of my country, its safety, and its prosperity, alike depend on Union, and *he who would contemplate its destruction, even for a moment, and form plans to accomplish it, deserves the deepest anathemas of the human race.*

In 1861, Henry A. Wise is willing to see the Union destroyed. On the 5th of July, 1858—only three years ago—standing in the presence of an assemblage gathered together to witness the obsequies of James Monroe, he said :—

Listen to me now, and to what I am going to say—I wish that there was no noise and that there was silence in all the earth, and that I had the trumpet of an archangel to sound it everywhere. When your fathers attempted to form this Union, they did not know beforehand what sort of a Union it was to be. They set to work and did the best they could under the circumstances. What they would accomplish no man could tell. There was not a head upon either that could foretell what it was to be ; but *they went in for Union for Union's sake.* By all the gods, by all the altars of my country, I go for Union for Union's sake. They set to work to make the best Union they could, and they did make the best Union and the best government that ever was made. Washington, Franklin, Jefferson—all combined, in Congress or out of Congress, in convention or out of convention, never made that constitution—God Almighty sent it down to your fathers. It was a work, too, of glory and a work of inspiration. I believe that as fully as I believe in my Bible. No man, from Hamilton, and Jay, and Madison—from Edmund Randolph, who had the chief hand in making it—and he was a Virginian—the writers of it, the authors of it, and you have lived under it from 1789 down to this year of our Lord, 1858—none of your fathers and none of your fathers' sons, has ever measured the hight, or the depth, or the length, or the breadth of the wisdom of that constitution.

If we think our Southern brethren mistake in thinking that a confederacy is better than a government founded upon the Constitution of the United States, we refer them to the opinion of James Madison. He said :—

If we recur to history and review the annals of mankind, I undertake to say that no instance can be produced of any confederate government that will justify a continuance of the present system, or that will not, on the contrary, demonstrate the necessity of this change, and of substituting, for the present pernicious and fatal plan, the system now under consideration, or one equally energetic. The uniform conclusion drawn from ancient or modern confederacies is, that instead of promoting public happiness or securing public tranquillity, they have, *in every instance,* been productive of anarchy and confusion—ineffectual for the preservation of harmony, and a prey to their own dissensions and foreign invasions.

Speaking of the then-existing confederation, Mr. Madison, in the same speech, said :—

Its debility was perceived almost as soon as it was put in operation. The confederation is so notoriously feeble that foreign nations are unwilling to form any treaty with us ; they are apprised that our general government cannot perform any of its engagements, but that they may be violated at pleasure by any of the States. Our violation of treaties already entered into proves this unequivocally.

HISTORICAL SKETCH OF FIREARMS IN EUROPE.

Historians are not agreed as to where and when artillery was first employed. It is now believed, upon good authority, that gunpowder and guns were used in China fifteen centuries before they were known in Europe. The first artillery consisted merely of small iron tubes, which discharged leaden bullets armed with iron points, and shaped like pyramids, each having a square base. These tubes were usually mounted upon a carriage, and the gunners who operated them were protected with iron shields. At the beginning of the Fifteenth century, the use of firearms became general in the armies of Europe and in several of the Asiatic nations ; and at the present day, while we make much ado about cannon throwing 120-pound shot, and consider these missiles very large, we forget that much larger shot were used three centuries ago. The scale of calibres in the early days of gunnery ranged from 32 to the pound up to bombards throwing stone balls of 1,000 pounds. Bolts, burning arrows, fireballs, grenades, shells, case shot filled with balls (shrapnell), and incendiary or burning balls, were all used in the days of old.

Small firearms were employed in castles and cities for defense before they were used in field warfare. Large cannon were made of cast iron ; also, of wrought iron welded together and hooped ; and also of cylinders of iron hooped with rings.

At the battle of Tongres, in France, in 1408, it is related that three cannon were used of such great size that they threw stone balls weighing 300 and 500 pounds. At the siege of Caen, in 1450, twenty-four mortars were fired, and the bore of each was so large that a man could sit up straight in it. At the great siege of Constantinople, when taken from the Greeks by Mohamet the Second, there was one cannon which threw 600-pound stone balls. In 1631, cartridges were first employed in the armies of Gustavus Adolphus. The first muskets were called "matchlocks," because the charge was ignited by a match ; their barrels were about six feet long, and required a rest. The iron soldiers of Cromwell carried matchlocks ; the flintlock was introduced into England in the reign of Charles the Second. The inventor of the percussion lock was the Rev. Alex. Forsyth, a Presbyterian clergyman, who secured a patent for it April 11, 1807. The percussion powder was fed into the touchhole by a self-acting rod.

BREECH-LOADERS.

Breech-loading and many-chambered breech guns are pretty old. In Louis Napoleon's treatise on "The Past and Future of Artillery," it is stated that in the Fifteenth century there was an organ gun built with three tiers of barrels for throwing 140 balls at once. The Marquis of Worcester, in 1661, invented a breech-loader, the breech of which opened and closed with one-quarter turn of a screw. In 1664, Mr. A. Hill, of London, obtained a patent for a breech-loading pistol, the breech of which was hinged, and raised and lowered by a lever under it. There was a hole in the top of the breech to receive the charge.

In 1717, Mr. Jamas Puckle, of London, patented a revolver cannon, which was mounted upon a tripod and had a single barrel with a rotating charge chamber. The charge chamber was composed of several short cylinders revolving on a pin. Several sets of chambers, each set containing six or more charges could be used with the same barrel ; the discharged set being unscrewed and replaced with a loaded set. In 1776, Mr. P. Ferguson obtained a patent for a rifled breech-loader, which had a revolving tap for its breech. In 1808, Mr. George Richards patented a breech-loading wrought iron cannon, the breech of which had a screw plug which was operated by a lever like that of the Armstrong gun. The barrel of this cannon was rifled, and iron shot coated with both tin and lead were employed.

RIFLED GUNS.

The first patent taken out for rifled firearms was by Mr. Arnold Rotsipen, in 1635. He seems to have introduced the invention from Germany. In 1789, Mr. John M. Wilkenson patented a rifled cannon having two grooves, and shot having wings to fit into the grooves. This was similar to the system of rifles and shot recommended in the recent work of General Jacobs.

Rifled small arms and cannon are therefore quite old ; but until recently their efficiency has not been appreciated for the purposes of warfare.

It is true that in the French, Austrian, Swedish and British armies, there have been special regiments armed with rifles for the past seventy years ; but these were only employed as skirmishers, and were always few in number. The smooth-bore musket was the universal arm for infantry. The rifle was first adopted in the French army under Louis Phillippe as a general weapon. Rifled cannon were first used in the field in actual battle at the fight of Solferino, only two years ago, under the present Emperor of France.

Disabling Cannon.

We have heretofore fully described the common method of spiking cannon, and have shown that the injury was ordinarily but temporary. When time is afforded, such as the deliberate abandonment of a military work, spiking at the muzzle is sometimes adopted, and, when thoroughly done, with far greater embarrassment to those who subsequently come into possession. A shot is driven into the bottom of the bore by wrapping it with felt or using iron wedges, and employing an iron rammer to drive the ball home. When this is done to an iron gun, the only method of unspiking it is to bore a hole in the breech and drive the ball out, closing the hole with a screw. To do this, the gun, in most cases, must go back to the foundry. In brass guns, which usually have vent-pieces, these can be taken out and the ball expelled by wedges. Various modes for destroying cannon are adopted. Shells are sometimes exploded in them, while heavy charges are put in others, over which sand or shot is rammed to the muzzle, and bursting follows. One piece is sometimes fired against another, muzzle to muzzle, or the muzzle of one to the chase of the other. In iron guns, the trunnions are broken off ; with brass ones, a fire is lighted under the chase, and when struck with a heavy sledge while heated, the gun is bent and disabled.

Had time been allowed Colonel Anderson to destroy the cannon in Fort Moultrie before abandoning it, there can be little doubt, from his long experience as an artillery officer, that he would have left a legacy of crippled guns unfit for anything but the foundry.

Burying a Fort.

Quite an original method of taking a fort is described in the last number of *Blackwood's Magazine.* In 1696, a large Russian army besieged the Turkish fort of Azof, which was situated on a plain, strongly fortified, and had a small but well-disciplined garrison. No common approaches could be made to it, and the Turkish cannon swept the level with iron hail. In this case the engineering skill of the Russians was baffled, but General Patrick Gordon, the right-hand man of Peter the Great, and the only one for whose death it is said he ever shed a tear, being determined to take the place at any cost proposed to bury it with earth by gradual approaches. He had a large army ; the soil of the plain was light and deep, and he set twelve thousand men to work with spades, throwing up a high circumvallation of earth, and advancing nearer and nearer every day to the place, by throwing up the huge earth wall before them in advance. The men were kept in gangs, working day and night, the earth being thrown from one to another like the steps of a stair, the top gang taking the lowest place every half hour in succession. In five weeks the huge earth wall was carried forward nearly one mile until it rose to and above the highest ramparts, and the earth began to roll over them. This caused the Turkish governor to hang out the white flag, and *give in.* Had he not done so General Gordon would have buried the fortress.

KENTUCKY TO BE NEUTRAL.—The House of Representatives of Kentucky has passed resolutions requiring that State to maintain a strict neutrality during the present contest, and approving of Governor Magoffin's refusal, under existing circumstances, to furnish troops to the Federal government. The official vote in eighty-nine counties in Kentucky, for the Union delegates to the Border States Convention, is 98,561. Eighteen counties are yet to be heard from. The aggregate Presidential vote in November was 146,216.

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The Armstrong Gun.

All facts in reference to guns and gunnery are of absorbing interest at this moment. The Armstrong gun has attracted much attention, and has received a very sharp criticism from the London *Mechanics' Magazine* during the recent war in China. The statement was that though the Armstrong guns, under the most favorable circumstances, gave very accurate shooting, the casualties to the outlying riflemen were so serious that the guns had to be withdrawn at the most critical part of the action in which they were engaged.

We have published this statement before, and were inclined to believe it, as we had some confidence in the journal referred to. It is now asserted that if there had been any foundation for so extraordinary a statement, it would certainly have found its way into the *Times;* that there was not a word of truth in it, and no casualties of the kind ever occured; that guns used on the occasion referred to were inferior in range and accuracy, and in every way, to the 12-pounders now issued. They were hastily equipped, without any of the improvements which are now being applied; but still the practical test furnished of their efficiency was eminently satisfactory, and the manner in which they were worked did the greatest credit both to the officers and men engaged.

In regard to the use of the guns in actual service, Capt. Milward, one of the British officers, states "that the battery in action at Singhoon the 11th of August, fired an average of eighteen rounds per gun, at 1,200 and 450 yards, beside two shells at 2,100 yards, all with the most excellent effect. The concussion fuzes acted admirably; the practice was entirely against cavalry in open order, and quite prevented their forming for a charge, which they attempted more than once. The effect of the shells was all that could be desired; the two fired at 2,100 yards, dispersing a large body of cavalry instantly."

In point of strength the Armstrong gun had stood a perfectly unique test. A 12-pounder gun was fired two hundred times, according to the following programme :—Ten rounds with service charge of 1½ lbs. of powder, and single service shot of twelve pounds; ten rounds with same charge and a projectile equal to two service shot; ten rounds with same charge and a projectile equal to three service shot, and so on gradually increasing up to one hundred rounds, the last ten of which were fired with a projectile equal to ten service shot, and of such a length as to protrude several inches beyond the muzzle. The second hundred rounds were fired with double charges of powder, and with projectile increasing as before until they reached ten times the weight of the service shot, and again extended beyond the muzzle of the gun. The gun remained uninjured to the last, and would be issued for service. A 40-pounder of the strengthened pattern had also been tested in a similar manner, and had endured without injury one hundred rounds fired with service charges and projectiles progressively increasing in weight from forty to four hundred pounds, the latter forming solid cylinders which filled the bore to within three inches of the mouth.

The British government expect to have ready before the close of this year 1,057 of these cannon with their accessories, at a total cost, including the preliminary experiments, of some $4,000,000; also three hundred thousand rounds of ammunition. Of late the price of this gun has very much decreased. The original price of a 12-pounder was $1,250; it is now $600. The price of a 40-pounder was formerly $1,750; it is now reduced to $1,426; and the cost of the ammunition was likewise being reduced.

A New Map of the United States.—Mr. J. H. Goldthwait has just finished a map of the United States, which contains many important improvements (which are copyrighted), as follows :—The distance of every ten miles is marked on all the railroads. 2. Single and double track shown. 3. Titles and width of gage shows. 4. Position of forts. 5. Population of each State from 1790 to 1860. 6. Ratio of slaves to total population in the slave States. 7. The latest boundaries of all the territories given. 8. The time at any locality compared with noon at Washington and Greenwich. The map is about three feet in size, and is admirably adapted to the times, in tracing accurately and intelligently the movement of troops. It is published by G. Q. Colton, 145 Nassau street. See advertisement in another column.

Sanitary Measures for the Soldiers.

The Medical Commission of Massachusetts recommend the following directions to the attention of troops in the field :—

Soldiers should recollect that, in a campaign, where one dies in battle, from three to five die of disease. You should be on your guard, therefore, more against this than the enemy, and you can do much for yourselves which nobody else can do for you.

1. Avoid especially all use of ardent spirits. If you will take them, take them rather after fatigue than before. But tea and coffee are much better. Those who use ardent spirits are always the first to be sick, and the most likely to die.
2. Avoid drinking freely of very cold water, especially when hot or fatigued, or directly after meals. Water quenches thirst better when not very cold, and sipped in moderate quantities slowly, though less agreeable. At meals, tea, coffee and chocolate are best. Between meals, the less the better. The safest in hot weather is molasses and water, with ginger or small beer.
3. Avoid all excesses and irregularities in eating and drinking. Eat sparingly of salted and smoked meats, and make it up by more vegetables, as squash, potatoes, peas, rice, hominy, Indian meal, &c., when you can get them. Eat little between, when you have plenty at meals.
4. Wear flannel all over in all weathers. Have it washed often when you can; when not, have it hung up in the sun. Take every opportunity to do the same by all your clothing, and keep everything about your person dry, especially when it is cold.
5. Do not sit, and especially do not sleep upon the ground, even in hot weather. Spread your blanket upon hay, straw, shavings, brushwood, or anything of the kind. If you sleep in the day have some extra covering over you.
6. Sleep as much as you can and whenever you can. It is better to sleep too warm than too cold.
7. Recollect that cold and dampness are great breeders of disease. Have a fire to sit around whenever you can, especially in the evening and after rain, and take care to dry everything in and about your persons and tents.
8. Take every opportunity of washing the whole body with soap and water. Rub well afterward. If you bathe, remain in the water but a little while.
9. If disease begins to prevail, wear a wide bandage of flannel around the bowels.
10. Keep in the open air, but not directly exposed to a hot sun. When obliged to do this, a thin, light covering over the head and neck, in the form of a cap with a cape, is a good protection.
11. Wear shoes with very thick soles, and keep them dry. When on the march, rubbing the feet, after washing, with oil, fat or tallow protects against foot-sores.

English Rifled Cannon.

The rifled cannon which have recently caused so much discussion as to the respective qualities are the Lancaster, Whitworth, Blakely and Armstrong guns. We will give a brief history and description of each. July 3d, 1850, C. W. Lancaster, of London, obtained a patent for making cannon and small arms with oval spiral grooves. These grooves have no sharp edges. Lancaster cannon and small arms have many advocates. Joseph Whitworth, of Manchester, secured his patent Dec. 1st, 1854, for rifled fire arms—cannon and muskets—with twisted polygonal grooves. The polygonal bore has also its advocates. On Feb. 11th, 1857, Sir William Armstrong secured a provisional patent—all that he has ever obtained—for rifled cannon. In his description of it, it is simply proposed to form a cannon with an internal tube of iron or gun metal with cylindrical casings of wrought iron shrunk over them. It is also stated in the specification that a moveable breech may be used with a screw. There is no new principle of construction in the specification, indeed, the most noticeable feature in it appears to be exactly similar to the principle of constructing cannon patented two years before, Feb. 27, 1855, by Captain Blakely. This patent claims constructing cannon with an internal tube of cast iron, surrounding with a casing of wrought iron or steel of ring-form shrunk on; or by having coils of wire secured around the cylinder. "Heavy ordnance," he says "may be made of cast internal cylinders bored in the usual way, and upon which rings of iron, breaking joints, may be shrunk."

In 1852, A. Krupp, of Berlin, Prussia, patented the constructing of cannon having an interior tube of cast steel, surrounded with a casing of cast iron or gun metal.

Mr. Thomas Prosser, Platt street, this city, informs us that Krupp manufactures breech-loading cast steel cannon, and that 600 six-pounders of them have been made for the Prussian government alone. He has also supplied several of the other continental governments of Europe with his cannon. These rifled steel guns, without the breech-loading arrangement, can be furnished at the rate of nine per day; caliber, 2½-inch bore, 50-inch long; and weight only 315 lbs.; or one per day of 8-inch bore, and 110 inches long; weight, 8000 lbs.

Troops at Elmira.—There are now at the encampment at Elmira, N. Y., over 7,000 troops.

NEW MILITARY WORK.

The Soldiers' Guide, A Complete Manual and Drill Book for the Use of all Volunteers, Militia and the Home Guard, Revised, Corrected, and Adapted wholly to the Discipline and Drill in the United States Army, of the Soldier and Volunteer at the present time, in Conformity with the Orders of Lieutenant-General Winfield Scott. By an Officer in the United States Army.

This is a little work published, and sent free of postage on receipt of 25 cents, by T. B. Peterson & Brothers, 306 Chestnut street, Philadelphia. As a specimen of the contents we copy the following definitions :—

Accouterments, denote the belts, cartridge-box, scabbard, &c., of the soldier.

To *Deploy*, to display, to spread out; a column is said to deploy, when the divisions open out, or extend to form line on some one of those divisions.

To *Dress*, is to keep the body in such a relative position, as to contribute toward, and form a part of, an exact continuity of line, upon whatever front, or in whatever shape, the battalion may be formed.

Field officers.—Colonels, lieutenant-colonels, and majors, are called field officers.

File, is a line of soldiers drawn up behind one another. As a general term a file means two soldiers, the front and rear rank man. Every soldier of infantry covers a space of twenty-one inches.

General officers.—All officers above the rank of a colonel.

Haversack.—A bag made of linen or rubber, for troops to carry provisions in while on the march.

Line, or *line of battle*, is the arrangement or disposition of an army for battle; its front being extended in a straight line as far as the ground will permit, in order that the several corps of calvary and infantry which compose it, may not be cut off or flanked by the enemy. European armies, and ours are usually drawn up in three lines; the first being named the *van*, the second the *main body*, and the third is called the *rear guard*.

Parole.—A word given out every day in orders by the commanding officer, both in camp and garrison, in order to know friends from enemies.

Patrols.—A small party of men, under a non-commissioned officer to command them, detached from the main or quarter-guard, to walk round the streets or roads, for the purpose of taking up disorderly persons, or such as cannot give an account of themselves, and to ensure the regularity or order of the camp or garrison. On the line of march, patrols are detached from the advanced guard to gain intelligence and to ascertain the presence or position of the enemy.

Reserve.—A select body of troops retained in the rear, generally to support an attacking force.

Reveille.—The beat of the drum at daybreak, after which the sentries cease to challenge.

Round, is a general discharge of cannon and musketry. Cartridges are generally reckoned by rounds; as forty rounds of ammunition.

Running fire, is that in which troops fire rapidly in succession.

New Iron-cased Frigate.—The new British iron-cased frigate *Defense* was launched a few weeks since at Jarrow, England. Her length is 292 feet; breadth, 54 feet; depth, 38 feet 2 inches. She is pierced for 28 guns, and is 3,669 tuns burden. The iron plates of the hull are 4½ inches thick, 3 feet 3 inches broad, and from 13 to 15 feet long. Teak planking, 18 inches thick, is secured under the plates. This vessel is to have a strong iron beak for striking a hostile ship under the water line and sinking her at once. The consort of the *Defense*—named the *Reliance*—was lately launched at London; the two are to be precisely alike, and will carry an armament of 24 Armstrong 100-pounders. In the course of three months, the British government will have four great mail-clad frigates finished and equipped for action.

Southern Confidence.—As a significant indication of Southern confidence in the insecurity of affairs in that section, we may mention the fact that, within a few days past, we have received from parties residing in slave States thousands of dollars intrusted to us for safe keeping. This shows, in language stronger than words can express it, what some of our Southern friends think of us and of the government under which we live. We received one single draft for ten thousand dollars.

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Correspondence

LETTER FROM WASHINGTON.

WASHINGTON, May 20, 1861.

MESSRS. EDITORS :—We are most happy to be able to state that, amid all the turmoil and excitement incident to other governmental departments, the Patent Office is now exhibiting a highly creditable degree of efficiency and activity. The Rhode Island soldiers, which, for a short time past, have occupied some of the halls of the department, have removed to their encampment, so that the public now enjoys the usual free access to all the models and records.

The city of Washington never presented greater attractions for visitors than at the present moment. The leading thoroughfares of travel to the capital are again permanently and safely open, the hotels are full of life and good accommodations, the Patent Office, with its priceless treasures of art and genius, extends a hearty welcome to every comer, and the broad avenues of the city are the constant scenes of imposing military displays. We have no doubt that Washington will soon be thronged with visitors.

The new Commissioner of Patents, Hon. D. P. Holloway, evinces abilities and qualifications for the office of a very high order, and his administration thus far gives eminent satisfaction to the public. His position is no sinecure. His whole time, early and late, is zealously devoted to the duties of the office which, under the new law, are exceedingly onerous. Many old errors and abuses that had crept into the department, under the preceding lax administration, are in process of eradication; new regulations are being prepared, and everything indicates that the establishment is beginning to feel, beneficially, the control of an energetic and able governor.

The provisions of the new law respecting the printing of the patents are now being carried into effect by Commissioner Holloway. We have examined some of the proofsheets of the letterpress, and they are admirable specimens of typography. The drawings that accompany the patents are to be copied by the photograph, and reduced in size to pages that correspond with the letterpress. The public will thus be put in possession of accurate printed copies of all granted patents at a reasonable price, done in splendid style, occupying but little bulk, superior in convenience and in other respects to the famed English and European patent publications. We predict that the inauguration of this excellent plan of producing the American patents will constitute one of the crowning features of Commissioner Holloway's administration. It is the commencement of a great and imperishable work, with which his name will be inseparably connected.

Another very commendable movement by the present Commissioner, consists in the abolition of the "Revisory Board." Its members have been disbanded, and the useless appendage no longer exists. It was founded in passion and folly by the ex-Commissioner, Governor Thomas, and its operations in the office were hurtful rather than beneficial. We believe that, for the most part, this Board was in the habit of glancing over the claims allowed by Examiners, and, with a stroke of the pen, approving them, without further examination, thus making a farce of the "revising." The exception to this rule was an occasion now and then, of which the members of the Board took advantage to spread upon the records their personal, antiquated, chronic, but erroneous views concerning combinations, patentability, &c., with which everybody in the Patent Office was familiar, and knew to be incorrect. Previous decisions of the courts, often upon points precisely similar to those in issue, seemed to have no weight with this Board. They had their own notions of the patent law, which were so bred in the bone that no judges or courts ever established precedents *for them*. The result was that in nearly every case where the Board undertook to decide adversely and discuss the legal aspect of a case, the Commissioner was compelled to review the matter and set aside their decisions. These proceedings occasioned great delay to applicants, and no benefit resulted. But the Revisory Board is abolished, and we are glad of it. The members have returned to their former duties.

We are glad to hear that the Commissioner of Patents contemplates some change in the method of disposing of interference cases. At present they are all decided, in the first instance, by a single Examiner, who makes it a special duty. We regret to say that a very strong prejudice against the official fairness and reliability of this officer prevails, which, to our minds, renders it imperative that a change should be made. Besides, the present method strikes us as being directly at variance with the plain provisions of the new statute, which requires that interferences shall be decided by the Examiners: *i. e*, by the Examiners of the class in which the interference arises. If our view be correct, then the impropriety of placing all the interference decisions in the hands of one person will be apparent.

The Board of Examiners-in-Chief, by whom all appeals are heard in the first instance, is now complete, Mr. J. J. Coombs, of Washington City, having been appointed to the vacancy. Mr. Coombs is a lawyer of some note, and was the candidate for the District-Attorneyship of Washington. We believe that he is a gentleman of ability; but what his views are upon patent law remains to be seen. The new Board, being now fully organized, will have a fair opportunity to show the public the stuff that it is made of. We hope that it will earnestly seek to establish itself in the confidence and esteem of the people. This can only be done by the adoption of systematic and inflexible rules of liberality toward inventors, in accordance with the well established decisions of the courts. The Board has not acted upon very many new cases as yet, and of course no permanent rules or regulations have been fixed. We notice, however, that, in some of its actions, it has failed to place the reasons for its decisions on record. It has contented itself by merely reporting that it thinks that the application "does not present patentable novelty," or that it thinks "the patent ought to be allowed."

We have already heard much dissatisfaction expressed at this summary way of disposing of cases, and we think there is just reason for complaint. It certainly does not accord with the usual method adopted in all courts of review. The Examiners-in-Chief are oppointed at a high salary to hear and weigh every fact and matter that can be adduced in regard to any case. Their decisions should be carefully given and their reasons for action fully recorded, so that the Examiners and all who have intercourse with the Office may be thereby directed and guided. In no other way can the decisions of the Patent Office be rendered uniform. To secure uniformity was the express object of the law makers in creating the Board.

Premiums at Agricultural and Mechanical Fairs.

MESSRS. EDITORS :— I have become a firm friend of the SCIENTIFIC AMERICAN lately, and could not be induced to forego the luxury of reading it for double the cost of single subscription.

I have only taken it since January, and was greatly surprised, on inquiry, to find that there are less than half a dozen copies taken in this county, though we have a fair share of mechanics, millwrights and scientific farmers. I am making efforts to increase its circulation, and think I shall succeed reasonably, though this is not a favorable season for such business. Our County Agricultural Society has dispensed a good many premiums, for the last two or three years, in the shape of a year's subscription to an agricultural paper, and the plan works admirably—much better than if this small amount be given in money—and the benefit to farmers is incalculable. Premiums are awarded not only on farm products but on all kinds of mechanical industry.

Now, I would suggest to the friends of the SCIENTIFIC AMERICAN the propriety of working in this direction to increase its circulation and spread useful knowledge broadcast through our land.

Let agricultural societies offer the SCIENTIFIC AMERICAN as premiums, and, in this manner, thousands of dollars' worth of premiums may be distributed at a cost of only $1.40 each. J. N. DUDLEY.

Mitchell, Iowa, April 22, 1861.

[*Apropos* to the above, we have just received the Clermont *Courier*, of Batavia, Ohio, by which we see that the plan of including subscriptions to the SCIENTIFIC AMERICAN among the list of premiums has been adopted by the Clermont County Agricultural Society. We respectfully submit to the managers of other societies whether there is any other mode in which they can use the same amount of money that will contribute so much to advance the special objects for which their societies have been formed.—EDS.

Hotbeds with Fire Heat.

MESSRS. EDITORS :—Last year being my first attempt at farming, I endeavored to invent an improvement in forcing vegetation. I dug an underdrain about 80 feet long and 3 feet 3 inches deep, and at the upper end curbed up an opening to the surface for a chimney to draw through the heat of a fire made in the lower end. But unfortunately the land and drain sloped to the west, and having only about two feet fall, it was too damp to draw unless the wind was from the west, which was rarely the case, the wind being generally from the north or south. I made a few fires in it, and inserted a thermometer about six inches below the surface, and ascertained that there was an elevation of temperature the next day after the fire was made; and at the end of the season, found the potatoes in a patch over it twice as large as those in any of three other patches, where I thought the soil was equally good, but which perhaps was a little too near to some fruit trees. Those whose lands require draining in the direction of the prevailing winds, or where they are much sloping, may, if fuel is cheap, have underheat at less cost than they can in the ordinary way. After the drain is once heated, it will draw if the wind ceases or changes. The land experimented on was what we call dry upland. When heat is desired, the outlet of the drain should be sunk a few inches lower than the other part, for the water to flow out under the fire, which may rest on grate bars, old pieces of iron or bricks. H. P.

Lafayette county, Mo., April 26, 1860.

Terrible Disaster at an Oil Well.

MESSRS. EDITORS :—An accident of a fatal and most alarming character occurred lately at a new well on the Buchanan Farm, a few miles up Oil Creek from its junction with the Allegheny, in Venango county in this State, by which sixteen men lost their lives, and many more are injured, some, no doubt, fatally.

We have had a number of accidents similar in kind to this, but seldom attended with fatal results. I alluded in a former communication to the great variation in the quality of the oil as found in different localities, showing a range of 16° to 20° of specific gravity by Baumé's hydrometer scale. The lighter grades of oil are highly inflammable and volatile. They rise from the mass in the wells in the form of vapor, and when they are relieved of pressure, they ignite at considerable distance from the surface of the oil well.

In most cases when oil is struck of this character, large quantities of carburetted hydrogen gas rush through the aperture opened by the drills. When this is incorporated in due proportions with the atmosphere (one volume of gas, with from four to seven volumes of air) it becomes as explosive as gunpowder, and more easily ignites. In this case a fountain of oil and gas was struck or opened, and, as usual in some sections of the oil regions, there was a violent rushing and spouting of oil, which was represented by living witnesses as rising fifty feet in the air, and flying in spray in all directions. There is always much excitement on such occasions, and men in the vicinity rush to see the wonder, which, in most instances, is a scene for rejoicing and congratulation. The fires in the nearest engines in the vicinity were quickly extinguished by water, and some thirty-five to forty men had gathered around this new oil fountain, when, as if by an electric stroke, an explosion took place which was heard and felt six miles distant. This atmosphere became an element of fire, and all within its influence were destroyed or terribly injured. Several persons were instantly killed; others inhaled the fire, and felt the terrible gnawings of internal fire as well as the external roasting of the flesh, and yet they lived some hours in anguish, begging friends to kill them.

The fire thus kindled is said by some to have come from a lighted cigar in the mouth of one of the proprietors, also a victim of the explosion; others think it was ignited from an engine fire 100 feet from the well.

Science and experience have frequently given warnings, and now a most terrific lesson speaks to those

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engaged in oil enterprises that surely will be heeded in the future.

For two days the fire raged unrestrained, flashing and leaping at times to 100 feet or more. Several derricks and fixtures in wells in the vicinity, and many hundreds of barrels (some say thousands) of oil were destroyed. Calamities of this character, like those of mine and boiler explosions, are properly the subject of notice in scientific journals.

JOSEPH E. HOLMES.

Meadville, Pa., May 12, 1861.

The Fresh-Water Spring at Sea.

MESSRS. EDITORS:—Mr. W. A. Booth, the coast pilot of the revenue cutter *Harriet Lane*, reports the discovery of a fresh-water spring at sea, off the coast of Florida, some eight miles off shore, and twelve miles from St. Augustine. This announcement recalls to my mind a report, some three or four years since, that millions of acres of the everglades had been drained of the waters covering them, within a short space of time; that to carry off that quantity of water in the time given, required an outlet not less than that of the mouth of the Mississippi, yet strange to say no outlet had been discovered. Could this water have taken the "Underground Railroad," and can this spring be the outlet? It is stated that when the St. John's river is high, the spring boils up higher than usual; and as the water of the St. John's and those of the everglades rise and fall from the same cause, there would seem to be a connection between the spring and the waters of Florida. It is said that this spring had been represented as a rock. I should like to ascertain how long since such reports have been made, and if such rock is laid down in our coast charts. Can it be possible that so strange a phenomenon could exist in such a locality for any length of time without being discovered? Unless it be proved that this supposed rock has been noticed long since, I must conclude that this spring is the outlet of the everglades. Further information on the subject is solicited.

DAVID SHINE.

515 Chestnut street, Philadelphia, Pa.

Saws in Cross-Grained Wood.

MESSRS. EDITORS:—Your correspondent, William Barnes, is right in his assertion that a saw, when sawing nearly but not truly with the grain of wood, tends to run across the grain, and this tendency increases until it has passed an angle of 45°, and continues with diminished tendency until it cuts at right angles with the grain.

Many years ago I observed this peculiar action, and believing it the result of imperfect setting and filing of the saw, I tried a full series of experiments on green and dry plank, with various forms of saw teeth and dressing. No natural law is more seen in its action than this; and the only way to overcome it is by stiff, firm saw plates, with sharp, widely-set teeth. Such saws work practically, but not perfectly, against the law.

J. HOLMES.

Meadville, Pa., April 19, 1861.

Twinkling of the Stars.

MESSRS. EDITORS:—In your issue of April 27, 1861, you say, "we have never seen an explanation of the twinkling of the stars that was at all satisfactory." Is not the solution suggested in your interesting article in the same number, entitled "Photographing Stars?" Is it not dependent on fact that the smaller stellar specks are thrown by the disturbed atmospheric refraction far beyond the limits of their small areas, so that a dark space intervenes where, a moment before, was a star; while the moon and planets are not disturbed the amount of their diameters.

G. H. KNIGHT.

Cincinnati, Ohio, April 30, 1861.

Prevailing Sentiments Among Inventors.

MESSRS. MUNN & CO.:—It is a matter of very great pleasure to state that, through your judicious and persevering efforts, our enterprise is at last crowned with success. We are also deeply impressed with the valuable service you have rendered us in securing the patent for the term of seventeen years. Be assured, gentlemen, we entertain a very high regard for that straight-forward, energetic method of business which has marked the case we had the good fortune to intrust to your care. We shall feel bound to recommend your agency to every one standing in need of such services as you are prepared to supply to inventors. Yours, most respectfully,

EDWARDS & HORNER.

New Brunswick, N. J., May 8, 1861.

MESSRS. MUNN & CO.:—Yours of the 9th is before me, with intelligence that you have been successful in obtaining a patent on my Pumps. Please accept my warmest thanks for your promptness and energy in the business I have entrusted to your care, and more especially for your promptness during the disturbed affairs of our country. Truly, yours,

W. W. ROBINSON.

Ripson, Wis., May 13, 1861.

MESSRS. MUNN & CO.:—I have just received your favor informing me of the success of my application for a patent, and you will please accept my sincere thanks for your promptness in preparing my case and carrying it through. I intend making another application soon, and it will be made through your agency. I remain, yours, &c., DECATUR PITMAN.

Fort Madison, Iowa, May 11, 1861.

A Grateful Patentee in a Seceded State.

MESSRS. MUNN & CO.:—I take this opportunity of acknowledging the reception, by mail, of the Letters Patent for my improved Plow Stock. I would also return to you my most sincere thanks for the very able and faithful manner in which you have conducted the case, rendered difficult, as it must have been, by the disturbances between the two sections of the country. Complimenting you for the skill and ability you have shown in bringing the case to a successful issue, I remain, as ever, yours truly,

Lee county, Ga., May 9, 1861.

[The above letter was received at this office on the 17th ult. We omit the name and address of the writer, lest his less friendly neighbors might take exception to his friendly allusion to the skill of his attorneys.—EDS.

The Comet.

The new comet, which has been for some time in the vicinity of the northern celestial pole, is now rapidly descending to the ecliptic, traversing the arctic constellations lying northward of Leo and Cancer. It is readily discernible by the naked eye, and is distinguishable at present by its nebulous aspect. A telescope of moderate power reveals the existence of a tail of several degrees length. The following parabolic elements of its orbit, computed by Mr. Safford, of the Cambridge Observatory, give important information of its future career while it remains visible in our skies:—

Perihelion passage June 4, at noon, Washington.

Perihelion distance 0.9235 of the earth's mean distance from the sun.

Longitude of Perihelion	242	deg.	30 min.
" Asc. Node	29	"	15 "
Inclination	8	"	14 "

According to these elements it will reach the ecliptic about the 12th inst., crossing the same in the heliocentric longitude occupied by the earth on the 19th of April, and at a distance from the sun equal to that of the earth at that date. It will continue to approach the earth for a few weeks longer, and will reach its perihelion on the 4th of June. These circumstances are favorable for its becoming quite a brilliant object in the evening sky before it disappears. So far as is now known, the priority of its discovery belongs to the American astronomer, Mr. Thatcher, of New York.

THE NEW CREATION.—Every Spring God works countless wonders. (We do not call them miracles, because we see them every Spring.) Out of a little bud, he brings a branch with leaves, and flowers, and fruits. From a tiny seed he evolves a whole plant, with its system of roots and branches. And more wonderful still, we see springing into life a new generation of insects and creeping things, and birds and beasts. "In wisdom hast Thou made them all."

THE French government had given notice that foreign cotton goods imported into France for the purpose of being dyed, shall come in free, equally with those intended for printing, on condition that they are also to be exported afterward. This is a piece of astute policy as the French dyers and calico printers are allowed to produce the most brilliant colors.

Planting Flowers for Autumn.

The following advice respecting the planting of flowers, by the *Country Gentleman*, should be acted upon by every person who possesses a square yard of flower plot:—

A well-managed flower garden will, at all times of the year when out-door plants can bloom, present a fine show of flowers. From the time the first snow-drop or crocus shows itself, perhaps through a late fall of snow, until the severe frosts have performed their work, and killed the last lingering roses, verbenas, &c., there should be a constant succession of bloom in all parts of the garden, so that no portion may appear unattractive. Considerable pains must be taken, and forethought exercised, to lay out and plant the flower garden in such a manner as constantly to present a good bloom. The late spring and early summer will have their bulbous plants and herbaceous perennials; the late summer its early sown annuals, and the autumn will have its dahlias, verbenas, and late sown annuals. This latter season, if the garden be properly managed, will not be any less attractive than the earlier months. Plox drummondii, planted in June or July, will equal or exceed the verbena beds of beauty. Candytuft, mignionette, balsams, and many other annuals, from late sowings, will keep up a constant bloom until frost. The late blooming perennial phloxes will make a spendid display in the borders. The rose acacia, among shrubs, will put forth a second display of bloom. The snowberry, the althea, the eunonymns, and a few other shrubs, will assist in the adornment of the garden in autumn. Roses, whether tender or hardy, will be in their glory through the fall months of the perpetual blooming varieties. In milder latitudes than ours the chrysanthemum will be a distinguished ornament of the garden. Of bulbous plants, the gladiolus in its many varieties, all beautiful and showy, the tuberose with its tall spike of pure and fragrant flowers, and the magnificent Japan lily will constitute the stock.

TURPENTINE AN ANÆSTHETIC.—In a communication to the *Lancet*, Mr. John Wilmshurst presents the ol. terebinthinæ rect. as a valuable anæsthetic. He says:—"The first case in which I tried its effect was that of Mrs. H., matron on board the emigrant ship *Indiana*, of which I was then surgeon-superintendent. About twelve months ago, having exhausted my little stock of chloroform, and the patient suffering from violent neuralgia in the course of the supra-orbital nerve, it occurred to me that of the remedies at hand the most likely would be the vapor of turpentine. This I immediately applied, sprinkled on a hankerchief to the nostrils, similarly to chloroform, and was surprised to find it not merely soothe and allay the pain, but after a few inhalations, produce a gentle sleep and state of anæsthesia, from which she awoke without any headache or other unpleasant symptoms, and quite free from pain. I may mention, without going into detail, that I have since tried it in one or two slight but painful operations—as extracting a broken needle from a sensitive part, and in some cases of cramps, convulsions, nephralgia, calculosa, &c. Its effect seems to be to allay nervous irritation, spasm, and pain, without deranging the action of the heart, and to produce a calm, anæsthetic sleep. The remedy being simple, inexpensive, and easy of application, will, I trust, induce some of your numerous readers, more skilled, and with better opportunities of testing its value, to experiment in the direction I have indicated, and to publish the result for the benefit of suffering humanity."

A NEW and magnificent equatorial telescope has been mounted at the British Royal Observatory. It is 15 feet in length, and the object glass is 13 inches in diameter. This is three inches less than the diameter of the object glass of Mr. Fitz's great telescope, described some time ago in the SCIENTIFIC AMERICAN.

NICARAGUA COTTON.—We have received from Charles Livingston, Esq., a sample, with some seed, of native Nicaragua cotton grown near Realgia, where it is very abundant and prolific. The sample is as fine and glossy as floss silk, which it resembles. Its luster far surpasses that of the finest Sea Island cotton, but its fiber is neither as strong nor as long.

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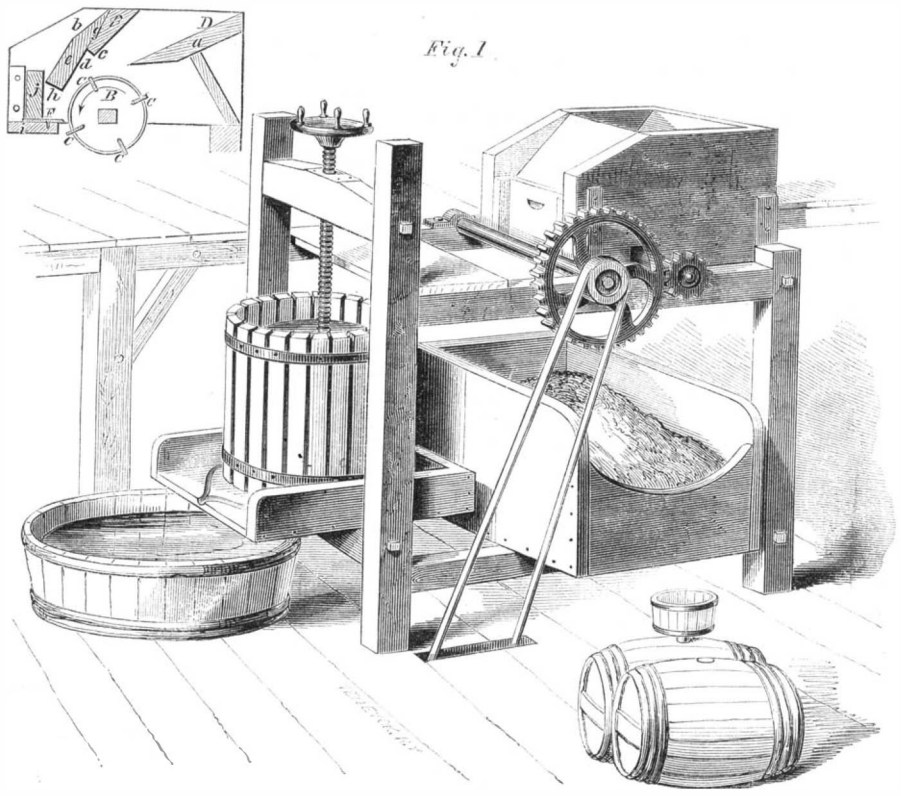
Improved Cider Mill.

The object of this invention is to obtain a machine that will crush the apples, and then scrape the broken or crushed parts, so as to procure a pulpy mass similar to the pulp that is formed by scraping an apple with a knife. From a pulp thus formed the juice is very readily extracted by pressure, the power required for the purpose being quite moderate.

Fig. 1 of the annexed cuts is a perspective view of the machine, and Fig. 2 is a section of the principal parts. The back part, *a*, of the hopper, D, is placed at an angle to guide the apples down upon the grinding cylinder, B, and the front side of the hopper is made in two parts, *e* and *f*, inclined at a small angle to each other, so that their lower edges, *c* and *h*, may form two ledges, the lower one nearer to the grinding cylinder than the upper one. Thus the apples are first broken by coming between the upper ledge, *c*, and the cylinder, and then more finely crushed by passing between the lower edge, *h*, and the cylinder. The metallic knives, C C C C, project a short distance from the surface of the cylinder, extending its whole length, and as the pumice falls down upon the metallic plate, F, it is scraped between the edge of this plate and the knives, C C, into a very fine mass. The front side, *i*, of the hopper is made moveable, and the plate, F, is made adjustable in its proximity to the knives, C C.

The importance of *scraping* apples to make cider has long been understood, and this little invention, unpretending as it seems, will very probably be found far more lucrative to its author, than many that are heralded with great noise and flourish.

Application for a patent has been made through the Scientific American Patent Agency, and further information may be obtained by addressing the inventor, S. J. Homan, at Walden, N. Y., or S. A Heath & Co., No. 102 William-street, this city.



HOMAN'S IMPROVED CIDER MILL.

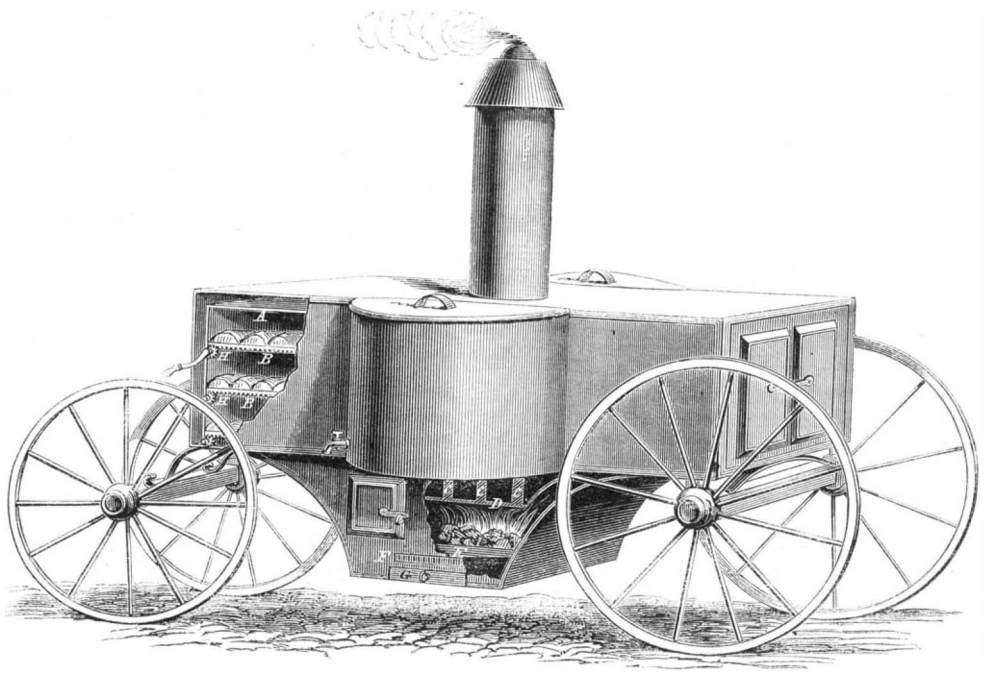
Stereochromic Paint for Hospital Wards.

— Dr. C. Bellmann, of Prague, gives the following paint for the walls of sick wards, which is preferable on account of its being easily cleaned with a wet cloth, and, at the same time, excluding dampness from without :— The rough plaster, instead of the fine finish of plaster-of-paris, is covered over with a mixture of two parts of finely sifted sand and one of air-slacked lime, made into a stiff paste with a solution of the double silicate of soda and potassa of 10° Beaumé. Instead of the latter two ingredients, a hydraulic cement may be used in the proportion of one part of cement to two of sand. When this is dry, the walls are whitewashed, and after an interval each of twenty-four hours, twice wetted with a solution of the double silicate of 15° Beaumé. Marble dust, if to be had cheap, may be used in place of half of the lime. Pigments may be added to the water-glass coating.

Some miners in Nevada county, Cal., have discovered in quartz a metal which an assayer of Sacramento pronounced to be tin.

A Portable Cooking Apparatus for the Army.

We respectfully invite the attention of our military authorities to the invention here illustrated. In the long series of inventions and improvements that have advanced the complicated art of war to its present state, the cooking department has been more neglected than any other; and there is no department more important. There can be no doubt that more soldiers die from improper food, drink and raiment, than from all other causes combined. It is true that within a few years this subject has attracted more notice than formerly. The French government has given it considerable attention, and the British government sent the famous cook, Soyer, to the Crimea during the Russian war to instruct the soldiers in the art of preparing their food. But there is yet ample room for improvement, and we are sure that our soldiers will be glad to see that the subject is attracting the attention of our inventors.



HILL'S CAMP COOKING APPARATUS.

The portable cooking apparatus represented in the accompanying engravings seems to us an admirable one, and we doubt whether any considerable improvement will be made in it, except, perhaps, in some of the details.

It consists of a large sheet iron oven and boilers, with a furnace mounted on wheels. The dimensions proposed are—length, 6 feet; width, 3 feet; and hight, 3 feet. The oven is made of Russian sheet iron properly lined, with three series of shelves for holding the loaves. These shelves rest upon ledges riveted to the inner sides of the oven, and they are furnished with racks, B B, which mesh into pinions, H H H, so that by turning these pinions by means of a crank, the shelves may be slid into or out of the oven at pleasure. The shelves are divided in the middle, so that one-half can be taken out of one end of the oven, and the other half out of the opposite end.

The furnace is placed directly beneath the bottom of the oven, and is covered by the coping, D, to prevent the fire from coming directly in contact with the plate of the oven; firebrick partitions, C C, being interposed between the coping and the oven plate. Beneath the grate, E, is the draft opening, F, and the ashpit, G. The smoke passes around the oven on all sides between the external plate and the lining, A, and escapes by the chimney, which is directly over the middle. Two boilers are placed on the sides of the oven, as shown. The whole is mounted on wheels, and can be drawn by a few men or one horse. A table and kneading trough are fitted to fold up so as to be placed in the oven during the march.

We do not see why one or more of these ovens should not be found a very useful addition to the apparatus of every regiment; effecting a great economy in the rations, saving a great deal of labor and fuel in cooking, and furnishing the soldiers with more wholesome and more palatable food.

Steps have been taken to procure a patent for this invention; and further information in relation to the matter may be obtained by addressing the inventor, E. H. Hill, at Worcester, Mass.

To Make Fine Weather.

—There is now before the Academy of Sciences, at Paris, a wonderful invention by M. Kelvetins Otto, of Leipsic, by which he promises to insure fine weather. He erects a platform at a considerable hight in the air on which he places a huge bellows worked by steam. With those he blows away the clouds as they gather, and as rain comes from the clouds, it must necessarily follow that when these are not allowed to gather, there will not be rain. He maintains that if there were a certain number of those rain propellers placed at intervals over the city, he can provide the inhabitants with a continuance of fine weather, a protection from sudden showers and muddy streets. This invention deserves the attention of those who wish fair weather for moving their residences.

Dr. A. Vogel, in *Dingler's Journal*, recommends the cyanide of potassium of commerce, either alone or mixed with borax, for welding powder. It is applied to the surfaces which are to be welded at a yellow heat of the metal, and the edges then hammered together.

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VOL. IV. NO 22.....[NEW SERIES.]....*Seventeenth Year.*

NEW YORK, SATURDAY, JUNE 1, 1861.

COTTON AND THE WAR.

Under this caption we recently published an article setting forth the conviction that if the struggle should be a prolonged one, it would put an end to the prëeminence of the cotton States in the supply of this important staple. For this assertion one or two of our subscribers in the cotton States are denouncing us as enemies to the South. It will ultimately appear, when the events now transpiring have reached their practical solution, that those who have "precipitated the South into revolution" will have done more to uproot their institutions than all the noisy abolitionists to be found in the country. What are some of the evidences of the truth of our position? The regular Paris correspondent of the Mobile *Register*, in a recent letter to that influential journal, states as one of the reasons why the Confederate States will not be recognized by the French government, that the news of the export duty on cotton, to be imposed by the Confederate States, has been received with no more favor than the Morrill tariff. Unless the Commissioners bring with them authority to revoke this provision, their mission to England is hopeless. Significant of the fate which attends them on this particular point, in France, is an article of five columns length, headed "Cotton," recently published in the *Moniteur*. The terminating paragraphs of this species of official manifesto, apparently exclusively devoted to dry statistics, but, nevertheless, not destitute of political significance at this juncture, would seem to indicate that King Cotton may be indulging in some illusions. The *Moniteur* shows that should any obstacle arise to diminish the supply from America, England will be able to get along with forty-five per cent of the number of bales received in 1860 from the cotton States, and "Algeria will find, in the new condition of affairs, a powerful encouragement to develop her fine qualities of cotton, rivaling the best long, silky Georgian."

Another important fact also is that all England is at work to get a supply of cotton. Lord John Russell has officially written to all the Ministers, Consuls, and Agents of the British government in the cotton-growing States and countries, calling upon them to stimulate the production of cotton to the uttermost. Immense efforts are making to that end, and also to cease all reliance upon Southern cotton as speedily as possible. Five millions of people in Great Britain are dependent upon cotton, and nearly one million directly rule the cotton factories of that country. Being thoroughly aroused by the conduct of the Secession States, it is the fixed purpose of the whole British people to draw off from the American cotton market as speedily as possible. Last year, about three-fourths of the supply of cotton manufactured in England came from the United States. This year, it is the expectation to procure not more than one-half the amount here, and gradually to reduce the whole.

A company has been formed in Manchester, called "The Manchester Cotton Company," with a capital of $5,000,000, Thomas Bazley, M.P., from Manchester, president. The company started with £500,000, and it was increased to the above sum as soon as the news of secession in America was received.

Another company has been formed in London, known as the "Jamaica Cotton Company," with a capital of £50,000, Samuel Gurney, M.P., chairman. An "East India Cotton Company" is also formed in London, with a capital of $1,250,000, and some of the leading capitalists of London are connected with it.

The "British Cotton Company," of Manchester, with a capital of $,100,000, has also been formed.

The "Coventry Cotton Company" is also formed, with a capital of $250,000.

The "Cotton Supply Association" is also vigorously at work, with its arms extended all over the world. This is an older association, having been organized for three years. The "African Aid Society," of London, recently formed, chairman, Lord Alfred S. Churchill, M.P., brother to the Duke of Marlborough. Lord Calthorpe and the Bishop of Sierra Leone are the vice presidents. Branches of this association are formed at Glasgow, Manchester, Birmingham, and other towns of Great Britain.

Two concerns have been started in Carlisle and Manchester, entirely for free labor goods.

It is stated that the best African cotton can be laid down in London at four pence and one farthing per pound, which is cheaper, we are told, than it can be procured from New Orleans.

At a recent meeting of the British Geographical Society, under the presidency of Sir R. L. Murchison, the great feature of the proceedings was the receiving communications, scientific and otherwise, in relation to a large and fertile region of Australia, known as Queensland, through which a fine river flows, and the prairie soil was capable of producing cotton of the very finest quality. A gentleman, named Crawford, said that, judging from authentic accounts, there could be no doubt that Qeeensland would produce cotton enough to supply all Manchester.

Africa, however, bids fair to become the amplest and best source of supply. The investigations of Dr. Livingstone and other missionaries have brought to light, on that continent, resources for the growth and exportation of cotton hardly equaled in any other portion of the globe. The regularity of the climate, the fact that a new crop may be raised every six months, the adaptation of negro labor to its cultivation, and the ease of its transportation down the large rivers, give Africa peculiar advantages; and it is said that even now Western African cotton, of a superior quality to New Orleans, can be laid down in Liverpool cheaper. The extent of this cotton-growing district, the fertility of the soil, and the industrious character of the millions of inhabitants, give assurance of an unlimited supply with right management.

It is impossible not to perceive, in facts like these, the first fruits of the attempt on the part of the cotton States to break up the Union. We firmly believe that the permanent interests of the cotton States are secure only in the Union under which they have advanced in power and wealth; and we believe that we are serving their interests best in our endeavors to sustain the government from overthrow.

RIFLING OLD SMOOTH-BORE CANNON.

All our old cast-iron cannon that are in good condition may be rifled, and thus made doubly effective for warfare. They are sufficiently strong, we believe, to withstand common charges; but if it is desired to subject them to extraordinary charges, they can be strengthened to any degree by shrinking wrought-iron bands upon them.

Mr. Bashly Britten, of London, has rifled several cast-iron service guns, from 9-pounders up to 68-pounders, with a few broad grooves $\frac{1}{16}$ inch deep in each, and they have been subjected to firing both solid shot and shell with great success. The 9-pounders were fired with $1\frac{3}{4}$ lbs. of powder; the 32-pounders with 5 lbs.; the 68 pounders with $7\frac{1}{2}$ lbs. The conical shot was used—the 68-pounder firing 90 lbs. shot. The rifled 32-pounders were tried with 48 lb. shells, the elevation being $23\frac{3}{4}°$. The average range was 5,585 yards—over three miles—the average deviation from the line of aim (target) was $7\frac{1}{2}$ yards with ten shots. These were again tried with an elevation of 10°. The average range was 3,292 yards; the average deviation, $1.\frac{66}{100}$ yards.

The unrifled smooth-bored 32-pounders were then tried with solid 32 lb. shot; charge of powder, 10 lbs. (double the quantity) and elevation, $10\frac{3}{8}°$. The average range was 2,738 yards; the average deviation, 25 yards.

It thus appears that by rifling old cast-iron cannon, their range is increased one-third, with half the charge of powder, while their accuracy is increased in the ratio of 15 to 1.

At a range of 6,000 yards, the old guns rifled had considerably more precision than the old guns unrifled at 3,000 yards, while, at the same time, they threw projectiles about 50 per cent heavier. They fire shells either with time fuzes or percussion shells which explode when they strike.

We have a large number of old cast-iron cannon in our arsenals, navy yards and forts. They can be rendered far more effective by rifling, which can be done at a moderate expense. Measures should at once be taken to improve a number of 9, 12, 24 and 32-pounders for effective service. The most destructive gun is that which has the greatest range, the most flat trajectory, and which carries closest to the line of aim. According to the experiments of Mr. Britten, common cast-iron cannon become triply more destructive after being rifled. Their range is greater at a lower elevation, which gives them a flat trajectory, and this is effected with smaller charges of powder. This is a subject which deserves the attention of our military engineers. There are plenty of machine shops in our country, in which tools could be adapted, in a very short period of time, to rifle cannon.

T-RAIL SHELLPROOF GUNBOATS.

No fact has been more clearly demonstrated than the total inefficiency of timber-built frigates—both steam and sailing vessels—to stand before the fire of land batteries throwing shell and hot shot. A single shell thrown from a 12-inch gun, striking the largest wooden steam frigate at her water line, would make a hole almost large enough to sink her. The two great fleets of England that were sent to the Baltic and Black seas under admirals Napier and Dundas, merely acted the part of blockading squadrons—they did not dare to assault fortresses. It was far otherwise, however, with the few iron-cased gunboats that were sent to the shores of the Crimea near the close of the war; they boldly faced land batteries and forts, and were successful in reducing several. These boats were not invulnerable against solid shot, but they were proof against shell, which are a thousand times more destructive. These lessons should not be thrown away; we need several iron-clad gunboats of light draft immediately. These should be capable of running into shallow bays, and coasting along shore at a high speed, bidding defiance to the shot and shell of land batteries, and proving a terror to pirates, privateers, and all such evil doers. But the question very naturally arises — How can we build such steam gunboats, seeing that we have no iron plates four or five inches in thickness, prepared for their construction? Well, if we have not, let us adapt ourselves to the circumstances of the case, and make the best use we can of what we have. Thus, we have plenty of T-rail iron everywhere, and we think it can be bent and adapted to the curves of several small but very powerful tug-steamers that are employed in our harbors. Cover their sides to about six inches below the water-line, and the whole of the deck with such rails running longitudinally, and arm each with one or two large pivot guns, and two 12-pounders. Twenty of such vessels would be worth an army of 20,000 men for offensive and defensive coast warfare. Such gunboats would be to the large vessels of our navy what flying artillery is to an army in the field.

The floating battery which was used at Charleston for the reduction of Fort Sumter, consisted of a strong timber frame filled in with cotton bales, and covered in front and on the roof with railroad iron. It resisted, unharmed, the solid shot which was fired against it from Fort Sumter, and during the whole bombardment, it is said, was actively served. This certainly affords some proof that it is capable of resisting shell, and that it is adapted, in cases of necessity, for rendering timber steamboats shellproof, and very effective war dogs of the sea.

BREAD raised by carbonic acid gas under high pressure is now being made in considerable quantities at the corner of Fourteenth-street and Third-avenue, this city. A barrel of flour can be converted into raised bread within the space of one hour.

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OPINIONS OF THE TWIST AND PROPORTIONS OF RIFLES.

The manufacturers of rifled firearms, as well as crack shooters, entertain different and contradictory opinions respecting the construction of such "shooting irons." All our American rifle makers, we believe, make their rifle barrels with an increasing twist, starting slow at the breech, and turning quicker at the muzzle. It has also been the practice with our rifle makers to have the muzzle for about two inches down slightly more contracted than the rest of the bore. We are now referring to muzzle-loading firearms. We understand that the French, German, Swiss and English rifle makers generally, also make their barrels with an increasing twist.

In opposition to such a practice, Mr. J. Whitworth, F.R.S. and machinist, Manchester, England, whose rifles have acquired a high reputation for accuracy, says:—"The use of an increasing or varying turn is obviously injurious, for, beside altering the shape of the bullet, it causes increased resistance at the muzzle—the very place where relief is wanted."

Now, Mr. Whitworth is perfectly correct, so far as it relates to the resistance to flight being greatest at the muzzle; but there are two resistances to be provided for, namely, the inertia of the bullet in starting, and that of the grooves which give rotation to the bullet. It is a reasonable and scientific practice, therefore, to give the grooves a slow twist at the breech—almost straight—and increase the twist at the muzzle, so as to offer the least possible resistance to the starting of the bullet, and, at the same time, obtain the desired twist for accuracy of flight. We can offer no good reason, however, for contracting the muzzle of rifles. Mr. Whitworth uses a uniform but quick twist in his rifles. The sporting rifles made by D. Fish, of this city, which have a high character for accuracy, and upon which the celebrated Swiss rifles are based (as he furnished the pattern), start with a four-foot twist, and end at the muzzle end with a twist of 30 inches for conical bullets of 80 to the pound—$\frac{6}{16}$ of an inch diameter at the base.

In an article on firearms, published on page 57 of the present volume of the Scientific American, we stated that there was quite a difference of opinion respecting the proportions of length of barrel to the bore of rifles. A correspondent, writing to us from New Haven, Conn., alludes to this, and says:—

A bore of ½-inch diameter attains its greatest range, force and accuracy with a length of barrel of 18 inches; one inch longer or shorter detracts perceptibly from the force. It is true novices will shoot straight with a long weapon, because any deviation from the aim is repeated once in each length of the barrel between the rifle and the mark; and, of course, a long barrel cannot have its length repeated as often as a short one. From this fact, and also from prejudice, most persons prefer a long weapon.

Our correspondent proposes that the proportions which he lays down should be applied to cannon as well as small arms. He gives us no scientific data, nor does he quote experiments in proof of such proportions being the best, and, in fact, they cannot be depended upon, although they approach nearly to those laid down by General Jacobs, of the British army. The fact is, that with a quick twist, we should always use a shorter barrel than with a long twist, and it is just with respect to these features on rifle-making that more light is wanted, and more experiments required, than we have yet been favored with.

OPINIONS ABOUT LEARNING TO SHOOT—THE POSITION.

On page 298 of the present volume of the Scientific American, we stated that some persons appeared to be naturally incapable of becoming good marksmen, as they *dodged*, just when the trigger was pulled. A Maryland correspondent alludes to our statement, and asserts that twenty years' experience and observation have taught him that any person may become a good shot by observing the following directions:—"Allow the rifle to hang in the hands in an easy manner, declined at an angle of about 40°; then raise it steadily but quickly in a line with the object, the eye ranging carefully over the sights, and at the instant the object arrived at is covered, touch the trigger." He says, "I find there is a moment in which the gun is absolutely still, that is, the instant the upward movement of it is arrested. These directions observed will certainly make a good shot. If the sight is lost at the first trial, it can be recovered by a second. Any deviation from this rule is fatal to accuracy."

It has been the experience of many persons in shooting that nervousness in firing is neutralized, in a great measure, by drawing the trigger slowly and steadily. We have known several nervous persons become very accurate marksmen, by cultivating a habit of steadiness, combined with promptness in touching the trigger just at the instant the sights covered the object, as described by our correspondent. All sportsmen who shoot birds on the wing, must follow this practice excepting in one feature, lowering instead of raising the muzzle. Our aborigines raise the muzzle when they fire; most of our rifle shooters and military men raise it first, above the line of aim, and then lower it. On this subject, marksmen differ in opinion as to which is the best mode.

As to the best attitude and mode of holding a rifle in firing, no single rule can be followed by all. Soldiers should learn to take aim and fire rapidly in all positions—standing, kneeling, or lying on the ground rolled up like clods behind tufts of bushwood or grass. One contends that it is impossible to shoot accurately with a rifle unless a person stands in the position of our Western riflemen—erect and sidewise, with the right elbow raised to the ear, muscles rigid as stone, the left hand merely supporting the rifle, and the elbow resting upon the side. This may be the very best position for hunters and fancy shooters, but a regiment of soldiers drilled to fire exclusively upon such principles, would make excellent targets for the skirmishing riflemen of our modern military corps. At a distance of 800 yards all the standing-up shooters could be picked off without a single Zouave exposing himself to a chance shot. Several well known marksmen condemn a rigid position of the muscles in shooting. They recommend an easy and graceful but firm position, the butt of the rifle held snugly, but not violently firm against the muscle of the right arm above the elbow, and the left hand placed under the barrel at the vertical axis—the point where the stock and barrel are balanced when held upon one finger.

SHOT AND SHELL.

The general adoption of rifled fire arms during a comparatively few years, is due principally to improvements in the missiles employed, namely, expanding bullets. These enable rifles to be loaded with great ease and rapidity, hence the adoption of the latter. Formerly shell were fired exclusively from mortars, now they are fired from cannon and small arms. There are two kinds of shell—the percussion and the fuse. The former is made with a nipple on the point, upon which is placed a percussion cap, which explodes when it strikes, and ignites the charge in the shell. The fuse is a match connected with the charge, and made of such length, that it will burn during the flight of the shell, so as to reach the charge at any calculated distance—1,000, 2,000 or 3,000 yards, &c. Breech loading cannon and rifles are most safe and convenient in loading with shell. Shrapnel is a shell loaded with a charge of small balls. These are scattered about in every direction when the shell explodes. If there is a mass of men, say at 1,000 yards distance, the ignited fuse is arranged to reach the column, and there explode the shell, scattering a quantity of shrapnel shot all around. Rifled cannon are not suitable for firing grape and canister shot, therefore, however effective rifles may be for long distances some smooth bores will always be used in batteries for the murderous discharge of grape at short ranges. Hot solid shot, and shells filled with molten iron are now used in warfare, chiefly in land batteries against ships-of-war. In August 6th, 1855, J. McIntosh secured an English patent for a shell filled with naphtha, and connected with a fuse which ignited the naphtha when the shell fell, and produced dense suffocating fumes. These shells are very dangerous when thrown into forts and ships.

The Steam Gun.—In reference to this uncouth war engine, illustrated in our last number, one of the men who was arrested while in the act of conveying it to the secession camp at Harper's Ferry, says:—"It requires fifty men to work it; it shoots behind and before and all around; it will certainly kill the fifty men employed in working it, beside dealing out its death strokes to thousands of those in whose defense it is employed." A very amiable machine, indeed, killing friend and foe. We suppose the inventor intended to use it for the purpose of committing suicide, or did he meditate the destruction of Ross and Thomas Winans?

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements lately patented:—

MODE OF PREPARING PAPER STOCK.

In preparing straw and other similar vegetable fibrous substances for paper stock, the straw or other substance is cut into pieces of suitable length, bleached and then reduced to a pulp by a suitable machine or engine. These vegetable substances contain, besides a fibrous substance, a hard matter which is a great detriment to the stock, as it is reduced to a powder, and, in the preparing the stock, is diffused through the pulp, and gives the paper a speckled appearance. The object of this invention is to obviate this difficulty by separating the hard worthless portion from the useful fibrous part. This is the invention of A. Randal, who has assigned it to J. J. Eckel, of New York City.

STEAM BOILER.

This invention relates to boilers composed of a lower water chamber and an upper water and steam chamber, connected by two or more circular series of upright tubes which surround a circular horizontal grate, and which have arranged in connection with them a curtain to produce an upward and downward draft among and between them. In the use of such boilers two difficulties have presented themselves: viz., that of obtaining sufficient grate surface for a suitable supply of oxygen among the fuel, and that of obtaining a sufficient natural draft to start the fire when the boiler is cold. The object of this invention is to overcome these difficulties, and to this end it consists in the arrangement, in combination with the circular horizontal grate and the tubes and in relation to the furnace door, of an upright grate admitting additional oxygen to the fire; and it also consists in establishing a direct communication between the firebox and chimney through an opening in the before-mentioned curtain, and a suitable space between the tubes opposite to said opening, such communication to be fitted with a damper which is to be opened only while starting the fire and getting up steam or when the fire is low and requires drawing up. The credit of this invention is due to G. W. Rains, of Newburg, N. Y.

GAS BURNER.

This invention relates to the arrangement of a gas burner with a reservoir containing a quantity of carbonizing liquid in such a manner that the gas is compelled to pass through said carbonizing liquid just before it reaches the top, and that the hydrocarbon vapors which are taken up by the gas in passing through the liquid in the reservoir have no chance to form a deposit before they pass out of the burner. It consists in making the tube which conducts the gas from the pipe into the reservoir and through the carbonizing liquid contained therein, adjustable in such a manner that it can be set according to the quantity of liquid in the reservoir, and according to the larger or smaller quantity of hydrocarbon vapors which it is intended to incorporate with the gas. W. H. Gwynne, patentee, New York City.

ROTARY ENGINE.

This invention relates to that description of rotary engine whose inner rotating cylinder or drum to which the pistons are attached is arranged eccentrically within a larger stationary cylinder. It consists in certain means of directing and controlling the compound radial and oscillating movement of the piston, and of packing the same within the rotating cylinder. This invention was patented by J. B. Root, of Battle Creek, Mich.

Preservation of Stone.—At a late meeting of the Institute of British Architects, Sir Henry Rawlinson stated that the old Assyrians were acquainted with modes of preserving stone from decay. In Mesopotamia he had seen a huge rock, the whole face of which was covered with inscriptions, coated over with some kind of varnish, which he supposed was the silicate of lime. These inscriptions were executed 900 years before Christ, were in a perfect state of preservation, and the varnish was harder than the limestone rock beneath it.

Southern Spirit.—At Newnan, Ga., the ladies are indulging in the pastime of shooting at a target with revolvers and other implements of warfare. The school boys also have formed themselves into a company of cadets, and are preparing to take part toward the close of the war. The little girls also are preparing bandages and lint for their friends at Pensacola.

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Progress of American Inventions in Europe.

Whether the old nations of Europe are to continue to be clad with our cotton or not, we hope that they will continue to receive the great benefits to be derived from the ingenuity of our people. We have not yet realized the effects of the war on the introduction of American patents into England, but up to the last dates there had been a steady progress in this movement. Since our last summary of the most interesting or valuable American inventions patented in England, we have received an account of the following:

Improved Permutation Lock.—Patentee, William A. Carpenter, of Elgin, Ill. This invention could be made intelligible only by means of illustrations.

Improvements in Sewing Machines.—Patentee, Albert G. Allen, of New York city. This invention consists in operating the needle of a sewing machine by a piston, similar to that of a steam engine, driven by compressed air. The patent also covers an oblique recess in the side of the shuttle raceway, rendered necessary by the peculiar mode of operating the machine; also the application of a turbine wheel for winding the thread.

Improved Manufacture of Water-proof Leather.—Patentees, Samuel La Forge, of Cleveland, Ohio, and Joseph Merwin, John E. Bray, and Asa G. Trask, of New York. This is an improved process for making leather. The skin of an animal from which upper leather is usually made must be taken after it has gone through the tanning process; but previous to its being put through the dressing process, and after having exposed it to a sufficient degree of heat, to drive off its fluid particles, it must be coated with a solution or compound of india rubber or gutta-percha charged with sulphur; the skin must then be subjected to the usual vulcanizing process, and the product will be a pliable, soft, and perfectly water-impervious article, glossy, and in every respect equal to japanned leather, without its liability to crack.

Improvement in the Construction of Windlasses.—Patentee, Joseph P. Manton, of Providence, R. I. This is a plan for varying the action of windlasses, increasing the power by diminishing the speed, or *vice versa*. The gear of the upright shaft engages with either a large or a small gear wheel, according to the direction in which the shaft is turned.

Improved Means of Relieving the Slide Valves of Steam Engines of Unnecessary Pressure.—Patentee, David Stoddart, of San Francisco, Cal. This invention was illustrated on page 177, Vol. II. (new series), of the Scientific American.

Improvement in Hair Brushes.—Patentee, John R. Ingersoll, of New York. The object of this invention is to avoid soiling the hands in using oil for the hair. A little reservoir is placed in the middle of the back, with an elastic head which, on being pressed, forces out a small quantity of oil into a bunch of fine bristles secured in the middle of the brush.

Knitting Machinery.—Patentee, James G. Wilson, of New York city. It would require full illustrations to give any idea of this invention.

Musical Instrument.—Patentees, Clarendon Williams and E. F. Falconet, of Nashville, Tenn. This instrument is composed of a number of bells, properly tuned and arranged, in combination with playing keys like those of a pianoforte, operating upon a suitably-arranged system of hammers to strike the bells; in combination, also, with proper dampers for checking the sound.

Improvement in Wooden-soled Boots, Shoes and Clogs.—Patentee, Marshall Jewell, of Hartford, Conn. This invention consists in making the soles of boots, shoes, or clogs double, or of two thicknesses, between which the upper leather of the boot or shoe is secured.

Washing Machines.—Patentees, Henry M. Coombs and Levi W. Nelson, of Portland, Oregon. This invention consists in the arrangement of an openwork cylinder composed of hollow slats within a cylindrical chamber surrounded by water, below which is placed a stove in such a manner that it will answer the two-fold purpose of heating the water and drying the clothes after they have been washed and rinsed.

Improvements in the Mode of, and Apparatus for Superheating Steam.—Patentee, Solomon Nunes Carvalho, of Baltimore, Md. The steam is passed into a retort containing black peroxyd of iron, in order to prevent the oxydation of the metal of which the apparatus is constructed; the retort being placed either in the furnaces of the boiler, or in the flues, or in a separate furnace.

Improvement in Ventilating Buildings, Vessels and Mines.—Patentee, Sidney Mason Stone, of New Haven, Conn. A duct for carrying off the foul air is heated by a flue or steam pipe passing up through it, and the fresh air is admitted through another duct from the outside of the building, or from above the deck of a ship, or the mouth of a mine.

Improved Guard for Boots, Shoes and Clogs.—Patentee, William A. Harris, of Providence, R. I. This invention was illustrated on page 304, Vol. III. (new series), of the Scientific American.

Compositions for Tanning.—Patentees, C. L. Robinson and T. G. Eggleston, both of Fox Lake, Wis. This invention consists in the employment of sulphuric acid in combination with terra japonica.

Improvement in Bakers' Ovens.—Patentee, Iverson W. Knapp, of New York city. The loaves are discharged automatically, and the oven is heated by pure air free from smoke and dust.

Patent Office Matters.

It will be seen from the letter of our Washington correspondent that business in the Patent Office is progressing favorably. The troops recently quartered there have gone into encampment, leaving all parts of the building now unobstructed. The Commissioner has disbanded the Revisory Board. He probably found, what we discovered from its foundation, that its labors were worse than useless. This action of the Commissioner shows that he intends to allow no obstacles to stand in the way of a prompt and energetic administration of the duties of his office. This Board was established by ex-Commissioner Thomas while in an ill-natured mood, and was never popular among the Examiners in the Office, or persons having business with the Office, and to the credit of the persons appointed to the Board it was even deemed a useless appendage by themselves.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING APRIL 30, 1861.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 4, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.

1,165.—Freeborn Adams, of Somerville, Mass., for an Improvement in Casting Copper Cylinders:

I claim as an improvement in the art of casting copper cylinders and tubes, pouring the fluid metal in two into the mold, on opposite sides, substantially as described.

1,166.—George Aldrich, of Armada, Mich., for an Improved Ladder:

I claim the combination of the self-adjusting platform, D G C, with the ladders, I I, and frame, F G, substantially as and for the purpose specified.

1,167.—Fred. W. Alexander, of Baltimore, Md., for an Improved Combination Lock:

I claim, first, The apparatus for detaching the bolt when shot from the ordinary machinery of the lock, substantially as described.

Second, The apparatus of combinatory and interchangeable slides, moving rectilineally substantially as described.

Third, The use of separate pieces of metal at w w′ u″ u‴, &c., in connection with the said slides, for the purpose set forth.

1,168.—F. L. Bailey, of Boston, Mass., for an Improvement in Printing Presses:

I claim the inclined belt, a a, or its equivalent, and the clasps, h′ h′, or equivalents, when the same are arranged in combination with the nipper frame, F, and its rectangular depression, x′, or their equivalents, substantially as described and for the purpose specified.

Second, I claim the stationary nippers, f u, &c., and adjustable clasps, h′ h′, or their equivalents, when the same are in combination with the belt, a a, or its equivalent, substantially as described.

Third, I claim the bands, a a, and d d, or their equivalents, when the same are in combination with the sheet supporter, 8, substantially as described and for the purpose specified.

Fourth, I claim raising the frame, F, by its own outward movement and the button, X, or their equivalents, substantially as described.

Fifth, I claim the crank, V″, sliding rod, m′, spring, o′, and lever, L, when the same are arranged and operate substantially as described.

Sixth, I claim the carriage, C, when the same is in combination with the vibrating nipper frame, F, or its equivalent, substantially as described.

Seventh, I claim the combination of the blocks, b2 b2, and rod, V, when the same are arranged substantially as described and for the purpose described.

Eighth, I claim the feed table, 7, when the same is in combination with the sheet supporter, 8, and belt, a a, or their equivalents, substantially as described.

1,169.—Abram Bassford, Jr., and W. B. Carpenter, of New York City, for an Improvement in Skates:

We claim, first, The hollow screwed post, c, with its screw-pin, b, and its collar or nut, k, or their equivalents, combined for the purpose described.

Second, We claim the post, d, with its screw pin, e, and collar, k, combined, or their equivalents, for the purpose set forth.

Third, We also claim the slotted hole, n n, in the plate, t, or its equivalent, when used in the manner and for the purpose specified.

1,170.—L. B. Batcheller, of Rochester, N. Y., for an Improvement in Pistons of Steam Engines:

I claim forming the pistons of horizontal steam engines with the recesses, e e, or their equivalents, on the lower side thereof, for the purpose of employing the force of the steam effectively to overcome the weight of said piston, substantially as and for the purpose shown and described.

I also claim forming the angles, i i, on the lower edge or periphery of the piston, substantially in the manner and for the purpose set forth.

1,171.—Henry Behn, of New York City, for an Improved Washing Machine:

I claim, first, The arrangement and construction of the upper and lower washboards in such a manner that the clothing shall be held fast by said washboards, while that part of the clothing situated between the two boards is being rubbed and washed, substantially as described and set forth.

Second, I claim the arrangement and use of square rollers on the ends of the washboards, forming a part of the same, and the manner of operating said rollers, for the purpose specified.

Third, I claim the arrangement of the slide, R, in combination with the upper washboard in the manner and for the purpose substantially as described.

1,172.—B. C. Bibb and Henry Augee, of Baltimore, Md., for an Improvement in Stoves:

We claim, first, The relative arrangement of a pedestal stove, A B, its front half projecting beyond the mantel front into the room, air-heating space, Z, hot-air columns, F H, and conical pipe, G′, in combination with a deflector and urn supporter, K, extending from the mantel front, substantially as and for the purposes set forth.

Second, The arrangement of the cold air-pipe, N, so that it receives its supply from the outside of the building, in the manner shown and described, in combination with a peripheric hollow chamber, P, having perforations, V, and the suspended pot, Q, all the parts constructed and arranged in the relation to the combustion chamber and to the hot air chamber of a fire place or pedestal stove, as described and represented for the purpose set forth.

1,173.—Wm. Brannan, of Gloucester, N. J., for an Improved Washing Machine:

I claim the combination of the yielding reciprocating roller frame, F, corrugated platform, C, and endless belt, D, with the yielding gravitating frame, H, and endless belt, K, substantially in the manner and for the purpose shown and described.

[The object of this invention is to clean the clothes by passing them in a movable endless apron through or under a reciprocating roller frame for the purpose of rubbing them, and by squeezing the same between one of the rollers carrying the endless apron and between a gravitating frame with two rollers carrying an endless apron in such a manner that the other roller of the gravitating frame bears against the inner roller carrying the first endless apron by the gravity of the other roller in such gravitating frame, the whole being so arranged that by this combined action the washing of the clothes is effected in a superior and easy manner, and with a small quantity of water.]

1,174.—S. P. Briggs, of Saratoga Springs, N. Y., for an Improvement in Hand Corn Planters:

I claim the attachment to hand, corn or seed planters of a tube, in connection with the plunger, substantially in the manner and for the purposes set forth in my specification.

1,175.—Amos Call, of Springfield, Mass., for an Improved Saw-set:

I claim a rotary hammer applied to saw sets, substantialty in the manner and for the purpose described.

1,176.—L. C. Chase, of Boston, Mass., for an Improved Halter Ring:

I claim constructing a halter "dee," or ring, with flanges, a a, provided with rivet holes, b b, and projecting rims, f f, substantially as described and for the objects specified.

1,177.—I. S. Clough, of Brooklyn, N. Y., and S. S. Day, of New York City, for an Improved Boot and Pantaloon Jack:

We claim a boot jack formed by combining the parts, A B C D E F G H and I, in combination with the yoke or stirrup, L, provided with the vertical jaws, M M, arranged and operated substantially as described and for the purpose specified.

1,178.—C. Comstock and C. Glidden, of Milwaukie, Wis., for an Improvement in Propelling Wheels:

We claim, first, Feathering the paddles by means of the lever rigidly attached to the axle of the paddle and having friction rollers which traverse the groove of a stationary cam, as set forth.

Second, We claim the guide or safety chain in combination with the lugs, as described.

1,179.—S. B. Conover and Marshall Spring, of New York City, for an Improvement in Machines for Digging Potatoes:

We claim, first, The swinging rake, M, and stationary screen, F, when arranged with the revolving screen, G, to operate as and for the purpose described.

Second, The combination of the two potato receptacles, J L, arranged relatively with the rotating screen, G, to receive respectively the large and small potatoes, and admit of the same being discharged in separate heaps or piles on the ground, substantially as described.

[This invention consists in the employment or use of a scoop arranged with a vibrating or reciprocating rake and stationary screen, a rotating screen provided with a spiral screen conveyor and potato receptacles, all being placed on or attached to a mounted frame, whereby potatoes may be scooped up from the hills or drills thoroughly separated from weeds and dirt, sorted into large and small, and discharged upon the ground in separate piles.]

1,180.—Wm. D. Cutler, of Millbury, Mass., for an Improvement in Shearing Sheep-skins:

I claim the application of cutters, as described, in combination with roll, G, No. 1, for producing the desired effect as specified and set forth in drawings and specifications.

1,181.—Commodore Daniels, of Barnwell C. H., S. C., for an Improved Apparatus for Training Horses or Mules to Rack:

I claim arranging the straps, D D G, and surcingle, A, in the manner and for the purpose set forth and described.

1,182.—T. W. Evans, of Philadelphia, Pa., for an Improved Telegraphic Cable:

I claim the combination of wires arranged together in parallel lines and drawn into the shape of a cylindrical whole, as represented at A, by which the superficial metallic surface exposed is reduced, thus diminishing the capacity of electrical condensation, whilst the cable is secured against liability to total fracture by being made to consist of distinct strands.

Second, The deposition of a plating of pure copper, gold or other metal upon the conductor in combination with it as described, thus increasing its conductibility, whilst, by the slight adhesion between the several integral wires, a total exclusion of air is secured.

Third, The employment of caoutchouc in an unelastic state as the first wrapping upon the conductor for the purpose of insulation, substantially as described.

Fourth, The combination of an outer coating of gutta-percha with the unelastic caoutchouc or first wrapping of the conductor, substantially as described.

Fifth, The employment of a third insulating coating of pure or vulcanized caoutchouc, and so uniting the several parts by heat or otherwise, for the purpose and substantially as described.

Sixth, The employment of a hemp or other fibrous envelop for submarine cables, when the same is treated with an anti-septic solution, substantially as described, in combination with the electrode and insolution, as set forth.

1,183.—S. W. Francis, of New York City, for an Improvement in Match Boxes:

I claim lining a match box, A, on its interior with sand paper, or an equivalent, so that, as the matches, C C, are drawn from the same, they shall be readily ignited, substantially as described.

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1,184.—Prince Hiller, of Mattapoisett, Mass., for an Improvement in the Locks of Firearms:

I claim a main spring coiled around the shaft, in connection with the adjustable tumbler, the several parts being arranged as and for the purposes set forth and described.

1,185.—D. Hitchings, of Richfield, N. Y., for an Improvement in Reapers and Mowers:

I claim the construction of the frame of the machine by the combination of the main axle, A, and its adjustable braces, c h, with the single cross frame piece, c, connected with the short axle, E, and box, D; by means of flanges, z z, the said parts being arranged in the manner and for the purpose specified.

1,186.—Benjamin Hostler, of Brookfield, N. Y., for an Improvement in the Mill Picks:

I claim hinging the stock, A, and lever, B, together, so as to clamp the picking tools by means of the handle, substantially as described.

1,187.—H. H. Hudson and G. W. Billings, of Cleveland, Ohio, for an Improvement in Water Elevators:

We claim, first, The dividing share, E, either with or without friction rollers at the ends, for separating the coil of rope upon the pulley, D, as specified.

Second, We claim the arms, F, with the guard, S′, as shown, for the purpose of presenting the bucket in a right position to the spout, and causing its lateral movement towards the spout, in connection with a movable or stationary bail or tipper, L, operating in the manner and for the purpose set forth.

1,188.—B. B. Kenyon and I. S. Brown, of Hopkinton, R. I., for an Improvement in Water Wheels:

We claim increasing the diameter of the wheel and the width of the buckets, D, immediately below the casing or curb, K E, in combination with the exterior rim or cylinder, M, substantially as and for the purposes set forth.

1,189.—Frederick Ketler, of Milwaukie, Wis., for an Improved Stump Extractor:

I claim, first, The use of the borer, V, represented in Figs. 1 and 2, employed for the purpose of splitting the stumps.

Second, I claim the splitting or cutting wheel, X, in Fig. 1, which will cut the stumps conically to any desired depth.

Third, I claim the chain saw in Fig. 3, which is carried round by the rollers or pulleys, l and o, to cut the stumps conicaliy to any desired depth.

Fourth, I claim the planing or paring machine in Fig. 5, which is operated by the forked piece, V2, and shaft, 3, which machine is used for the purpose of paring or planing away the stumps conically to any desired depth.

1,190.—Archibald Kirby, of Paris, Ill., for an Improved Excavator:

I claim the combination of a revolving scoop and truck frame, provided with a shovel edge, C, as and for the purposes described.

1,191.—W. B. Little, of New York City, for an Improvement in Signs:

I claim the construction of illuminated signs in the particular manner represented and described,

[This invention and improvement in signs refers more especially to those which are used for out door purposes, the object being to produce a sign which will be both useful and ornamental as a day and a night sign, and by the aid of a light placed behind it at night the lettering will be visible and intelligible for some distance.]

1,192.—Harvey Locke, of South Boston, Mass., for an Improvement in Pumps:

I claim, first, The annular valve, H, so constructed as to disclose when opened a water way around the whole circumference of the cylinder, as described.

Second, I claim the disk valve, G, covering the whole end of the cylinder, as described, for the purpose set forth.

Third, And in combination with the valve, G, I claim the disk of india-rubber or leather confined to the piston, as set forth and operating as described.

Fourth, So connecting the inlet and outlet valves together that the motion of one of them shall control the motion of the other, as set forth.

1,193.—F. H. Manny, of Rockport, Ill., for an Improvement in Harvesting Machines:

I claim a supplementary divider pivoted near its point to the fixed divider or shoe of a harvester, in combination with an adjustable support near the rear end of said supplementary divider, substantially in the manner described, for the purpose set forth.

I also claim the combination of the supplementary divider, pivoted near its point to the fixed divider with a spring, substantially as described, for the purpose set forth.

1,194.—D. W. Maples, of Homer, N. Y., for an Improved Cheese Vat:

I claim, first, The distributor, Fig. 4, and q r r, Fig. 1, and its application to the purpose of an equal distribution of the heat in and under a vat for cheese-making, substantially as and for the uses and purposes set forth and described.

Second, The arrangement and combination of the stove, E, with its peculiar construction, substantially as shown in the drawings and specifications, and with the heating chamber, D, and the dampers attached, as described and shown, and with the aforesaid distributor, Fig. 4, and with the conductor for drawing off the whey, as constructed and arranged and described in Fig. 7 of said specifications, and applied to a vat for cheese-making, as described in said specifications, and as and for the uses and purposes described.

1,195.—J. W. Murphy, of Philadelphia, Pa., for an Improvement in the Mode of Adjustment of Truss Frames of Bridges:

I claim the elongated eye on the end of the counter, diagonal rod, C, its two blocks, G and H, and the two keys, I and J, the whole being arranged as and for the purpose set forth.

1,196.—Darius Musselman, of Lucas county, Ohio, for an Improved Combined Steam and Hot Air Engine:

I claim, first, The arrangement of the devices, as set forth, by which soot or ashes is prevented from entering the generator, which devices also return a portion of the hot air and gases to the furnace to be reheated.

Second, I claim the arrangement of the plunger, N, and the devices connected with it, by which said plunger acts as a safety valve, pressure indicator and regulator of the air passages for limiting the amount of motive power produced, substantially as set forth.

Third, I claim the arrangement of the feeder for introducing fuel into the furnace without permitting the escape of the condensed air contained in the air space surrounding the furnace, substantially as set forth.

1,197.—John Neumann, of New York City, for an Improvement in Faucets:

I claim the chamber, B, on faucet tube, A, having arranged within it the valve, c, and the screw stem, D, with its enlargement, g, all arranged and operating substantially as and for the purposes set forth.

[This invention relates to a new and useful improvement in faucets, intended especially for beer barrels where the barrels are kept in the cellar and the beer pumped up by a pump in the store whenever it is wanted.]

1,198.—George Norris, of New York City, for an Improvement in Filters:

I claim the combination of the perforated compression and discharge screw or tube, E, and plate, C, with the filtering material, B, and case, A, in the manner and for the purposes, substantially as described.

[The object of this invention is to obtain a filter of very simple construction, which may be so adjusted as to allow the water to escape, though it is in an unfiltered state, when filtered water is not required, as, for instance, for washing purposes.]

1,199.—A. Randel, of New York City, for an Improvement in Preparing Paper Stock:

I claim the combination of the differentially moving crushing rollers with the shredding cylinder, E, and spiked concave, F, substantially in the manner and for the purposes shown and described.

1,200.—G. W. Rains, of Newburg, N. Y., for an Improvement in Steam Boilers:

I claim, first, The upright grate, P, applied in relation to the grate, E, and in combination with the circular series of tubes, C C, and their interposed bars or plates, F F, substantially as and for the purpose specified.

Second, The flue, Q, and damper, R, applied in combination with the curtain, G, and the chimney, I, and the wider space, c c, between the tubes, D D, substantially as and for the purpose specified.

1,201.—J. R. Robinson, of Boston, Mass., for an Improvement in Steam Engines:

I claim so combining a variable cut-off and a throttle valve in connection with a steam engine that the cut-off only will act as the regulator when the engine is subjected to a resistance which requires the admission of the steam beyond a certain point in the stroke of the piston, and the throttle valve only will act as the regulator when the engine is subjected to less resistance, substantially as specified.

And I also claim so constructing and applying a variable cut-off gear which is combined with a throttle valve, as above specified, that as the throttle valve closes, the cut-off will operate later in the stroke of the engine, substantially as described.

1,202.—J. R. Robinson, of Boston, Mass., for an Improvement in Safety Plugs for Steam Boilers:

I claim, first, The combination of the ring or plug, b, of fusible metal of inferior conducting capacity, and a central plug, C, of infusible metal of superior conducting capacity, substantially as specified.

Second, The tube, d, combined with the plug, C, substantially as and for the purpose specified.

Third, The combination with the safety plug of a tube open at the top for the reception of water, closed at the bottom by the plug and permanently attached to the boiler, substantially as illustrated by A and H, Figs. 1 and 4, and specified.

Fourth, The combination of the tube, d, attached to and surrounding the plug, C, and the fixed tube, A, surrounding the said tube, d, and the plug, substantially as and for the purposes specified.

Fifth, The screw, F, applied in combination with the plug, C, substantially as and for the purposes set forth.

1,203.—J. W. Ross, of Boston, Mass., for an Improvement in Inkstands:

I claim, first, The use of the float, k, traveling in a suitable guiding tube, and operating substantially as described.

Second, The peculiar construction of the inkstand, by which I am enabled to lock it in or remove it from its stand or desk, the same consisting substantially of the screw, h, and top plate, i, attached to or forming a part of the ink fountain and a polygonal shaped opening of suitable form to receive a key, as described.

1,204.—J. B. Root, of Battle Creek, Mich., for an Improvement in Rotary Engines:

I claim the employment, in connection with the outer cylinder, A, eccentric piston drum, C, and rigidly constructed pistons, F F, of arc-formed pieces, a a, attached rigidly to the pistons and fitted to concentric grooves in the heads of the cylinder and segment pieces, d d, fitted to the pistons and to bearings in the rotating drum, the whole combined substantially as described.

1,205.—William Rowe, of Gharlestown, Va., for an Improvement in Machines for Threshing and Cleaning Clover:

I claim, first, The combination of two threshing cylinders with a clover separating machine, when said cylinders are arranged to rotate on the same axial line, the cylinders operating independently, as and for the purposes stated.

Second, I also claim the combination of the cylinders, C C′, with their concaves, C″ and C‴, substantially as and for the purposes stated.

Third, I also claim the combination of cylinders, C C′, with feed box, D, blast and section fan, e, screen, G′, and screw, h″, substantially as and for the purposes stated.

Fourth, I also claim the combination of screen, G′, with the box frame, C*, and screw shaft, h′, with its guide gears, as and for the purposes set forth.

Fifth, I also claim making the feed box, D, so that it, together with the parts connected therewith, as shown in Fig. 2, can all be removed, as and for the purposes stated.

Sixth, I also claim so making and connecting the parts shown in Fig. 5, so that they can be quickly detached for repairs or examination of the machine.

Seventh, I also claim a clover threshing and cleaning machine in which the parts are constructed and combined to operate in relation to each other as shown and described.

1,206.—George W. Soule, of Freeport, Maine, for an Improved Rigging Clasp:

I claim combining with the two griping jaws, A B, the hinged fastening, c, and the tapering link, C, working in eyes, a a′, substantially as and for the purposes set forth.

[This invention is a new and useful rigging clasp intended for setting up and hauling taught the standing rigging of a vessel, and to be used in place of what is called a "rope strap," which is liable to slip in almost every instance.]

1,207.—David J. Starrett, of Thomaston, Maine, for an Improved Coal Sifter:

I claim constructing the revolving screen, B, so that one end shall project out through a closely fitting aperture, a, in one side of the closed case, A, and turn therein as a bearing, so that, in connection with a removable cap, C, or its equivalent, the coal may be put in and taken out of the screen without removing the same from, or exposing the interior of the case, substantially as and for the purposes specified.

1,208.—Alfred Swadkins, of South Boston, Mass., for an Improved Steam Cock:

I claim the combination and arrangement of the two valves, B I, with the swivel, O, of the stem, C, such valves being constructed and connected by screws or mechanical equivalents therefore, substantially as specified.

1,209.—James H. Swett, of Pittsburg, Pa., for an Improvement in Spike Machines:

I claim, first, Supporting the header against lateral vibration by means of the shaft, b, and arms, O O, the latter moving against the outside of the frame, substantially as described.

Second, I also claim hanging the journals of the rockshaft, P, to which the header is connected in curved slots, for the purpose of changing the inclination of the header, to correspondingly change the position of the head upon the finished spike, substantially as described.

Third, I also claim the adjustable ways, S S, for the purpose of so clamping the slide, R, as that it shall not move by the weight or friction of the second slide, T, until forced to move with it, substantially as and for the purpose described.

Fourth, I also claim the adjustable [slide, H, in the arm, G, for the purpose of varying the motion of the nippers in relation to the motion of the header, and to draw out more or less of the blank, as the condition of the heated bar may require, as set forth.

1,210.—James M. Tolley, of Big Lick, Va., for an Improved Washing Machine:

I claim the combination of the two sets of rollers, c c′, with each other and with the disks, A B, when the rollers upon the disk, A, are arranged to cross those of the disk, B, all in the manner shown and described.

[This invention consists in the arrangement of the corrugated rollers in washing machines, tangentially upon the two disks, those of the upper or rotating disk crossing those of the fixed disks diagonally, which produces a centripetal and centrifugal movement of the upper and lower sides of the clothes alternately, as the upper disk is rotated back and forth, thereby effecting a more thorough agitation of them than can be produced when the two sets of rollers are arranged parallel to each other.]

1,211.—Daniel H. Viall, of Schaghticoke, N. Y., for an Improvement in Grain Cradles:

I claim the slotted bolt, f, constructed as described, in combination with the brace of a grain cradle, for the purpose set forth.

1,212.—Thomas S. Whitenack, of Easton, Pa., for an Improvement in Harvesting Machines:

I claim constructing the reel head, G, with plane plates or ears, e, for the attachment of the adjustable arms, f g, in combination with the said adjustable arms and the adjustable bars, k, all as set forth.

The arrangement of the slotted supporting segments, E E′, having their sweep concentric with the axis of the driving wheel, B, in combination with the adjustable arms, d, shaft, F, and the reel, in the manner and for the purpose shown and described.

[This invention relates to an improvement in the reel which is of the class arranged to work without an outer bearing, and consists in the employment or use of a metallic head or supporter with the beater arms or braces attached to it in such a way as to admit of the expanding of the beaters to a greater or less extent, as circumstances may require. The reel shaft is also so arranged as to admit of the ready elevating or depressing of the reel, as well as the tightening of the belt, as occasion may require. The inventton also relates to a novel and improved construction and arrangement of parts for elevating the finger bar and sickle, to allow the same to pass over obstructions, and also to admit of the adjustment of the finger bar and sickle at a greater or less hight, according to the hight it is designed to cut the grass or grain. The invention further relates to an improvement in the cutting device, whereby the same is made to cut smoothly and perfectly, and prevented from choking or clogging.]

1,213.—Hugh H. Whitney, of Waterford, Pa., for an Improvement in Beehives:

I claim constructing a hive by dividing the rectangular box, A, by the oblique partition, B, so as to form a sheltered area around the entrance, a triangular apartment for the swarm, with the passage, G, at the lower angle thereof, and hanging supplementary chambers or boxes, E, immediately back of the same, communicating therewith by means of the passage or passages, h, the whole being provided with the means of ventilation by the holes, g, at or near the entrance, G; the whole arranged and combined substantially in the manner and for the purpose shown and described.

I also claim the device for graduating the entrance to the passage, G, consisting of the adjustable slot, H, and hanging traps or doors, i, constructed and operating substantially as and for the purposes set forth.

1,214.—Solomon Fry, of Monongahela City, Pa., for an Improved Door Lock:

I claim the arrangement of the keyhole guard, h, springs, i and r, bolts, s and j, levers, q and t, click, k, and cams, o and p, arranged, constructed and operated substantially as described, and for the purpose set forth.

1,215.—John McAuley Gallacher, of Roxbury, Mass., for an Improvement in the Construction of Gas Retorts:

I claim the construction of the retort with longitudinal ribs and projecting lugs, as shown and described.

[This invention consists in the arrangement of lugs projecting from the outside surface of the retort and forming the supports of longitudinal ribs, for the purpose of holding the cement which is placed on the outside of the retorts to preserve them against the injurious effects of the fire.]

1,216.—G. W. Gould and P. W. Gould, of Evans, N. Y., for an Improved Washing Machine:

I claim the employment of the double reciprocating rubbers, D D, used in connection with stationary frame, B, substantially as and for the purpose set forth.

1,217.—William M. Griscom, of Philadelphia, Pa., for an Improved Shuttle Fastener:

I claim the bolt, D, its notch, y, the stud, E, and disk, F, with its inclined planes, in combination with the plate, B, and its socket, d; the whole being constructed as and for the purpose set forth.

1,218.—W. H. Gwynne, of New York City, for an Improvement in Apparatus for Naphthalizing Gas:

I claim, first, The use of a reservoir for containing a liquid hydrocarbon attached to the gas fixture, and provided with a pipe communicating directly with the burner, substantially as shown and described, and for the purpose explained.

Second, The arrangement of the revolving pipe, B, and reservoir, A, in combination with a gas burner, substantially as and for the purpose described.

1,219.—F. B. Hall, of Hartford, Conn., for an Improvement in Car Couplings:

I claim, first, In combination with a hopper head and a permanent bolt support connected thereto, a bow or U-shaped bolt constructed, arranged and operating therewith, substantially as described.

I also claim a counterpoised or overpoised link, the weighted end of which will fairly sit in its buffer head and hold the projecting end in a horizontal position so that it will fairly and truly enter the buffer head that it is to be connected with, substantially as described and for the purpose set forth.

1,220.—Wm. L. Haller, of Philadelphia, Pa., for an Improved Scrubbing Brush:

I claim a scrubbing brush composed of strips of india-rubber or analogous material, clamped in dovetail grooves in the body of the brush, and projecting from the face thereof, substantially as shown and described and for the purpose specified.

[This article has been thoroughly tested, and is found remarkable for efficiency and durability. Its original cost is much less than brushes in common use.]

1,221.—Henry Hartwig, of New York City, for an Improvement in Locks:

I claim the arrangement or the key bit, E, in a lock, turning loosely upon the key bolt, D, when said key bit is combined with a projection or stop, F, fast on the lockcase, in the manner and for the purpose set forth.

1,222.—Henry Hartwig, of New York City, for an Improvement in Locks:

I claim the arrangement and use of a wedge-shaped sliding piece, E, covering up the lower part of the keyhole, and operated by the introduction of the wedge-shaped bit of the key, as described.

1,223.—George Harlan, of Brownsville, Ind., for an Improvement in Seeding Machines:

I claim, first, The tubes, P, attached to bars or arms, Q, jointed and provided with springs, S, substantially as shown and described, to admit of a self-adjusting lateral movement of said tubes, for the purpose set forth.

Second, The combination of the cams, D, slides, F, and levers, T U, when the latter are connected by adjustable links, k k, and all arranged as and for the purposes set forth.

[The object of this invention is to obtain a seeding machine for drilling or sowing more perfectly than hitherto wheat or other grains or seeds among standing maize or Indian corn, a system of cultivation quite generally practised in the Western States of the Union.]

1,224.—A. C. Barstow (assignor to the Barstow Stove Company), of Providence, R. I., for an Improvement in Cooking Stoves:

I claim, in cooking stoves of square or quadrangular form, having in addition of the ordinary baking oven parallel to and on the opposite side of the fire chamber a roasting oven, I claim the arrangement described of the fire chamber and ashpit, in combination with a movable plate or its equivalent, so that the said roasting oven may be used separately rom or in connection with and as an enlargement of the baking oven, substantially as set forth.

1,225.—Theodore Burr (assignor to himself, C. L. Burr, S. W. McCrea, L. H. Brinkerhoff and Parcel Brinkerhoff), of Battle Creek, Mich., for an Improvement in Fracture Apparatuses:

I claim the application of the toggle braces, D, operated upon by a screw, in connection with extension splints, operating as described and for the purpose set forth.

1,226.—Edwin Campbell (assignor to Edwin Heath), of Bath, Maine, for an Improved Edge Key:

I claim, as an improved article of manufacture, a boot and shoe key, in which the parts are constructed and combined to operate in relation to each other as shown and described.

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1,227.—Valentine Felker (assignor to himself and Rufus Jones), of Carmel, Maine, for an Improvement in Plows:

I claim the arrangement of the plow holder, as constructed, of parts N H I F E and I, attached to plow, A, with plow governor, B, operating as described and for the purposes set forth.

1,228.—Richard Gornall (assignor to himself and Wm. J. Hooper), of Baltimore, Md., for an Improved Machine for Making Bullets:

I claim, first, The solid matrix, E, operating in connection with a suitable punch and core to first compress the bullet, and then hold it as a chuck or mandrel to be turned, substantially as set forth.

Second, The crosshead, F, links, G, lever, H, and rotary core, L, operating in connection with the matrix, E, to impart an intermittent vertical and rotary motion thereto, substantially in the manner explained.

[This is a machine for making Minié rifle balls. The bullet is first compressed within a solid matrix, and afterward projected therefrom and held by its base, in which position the required finish is imparted to its exterior by turning. The operation of the machine is automatic throughout. It dispenses with the necessity of hand trimming, and produces bullets with a rapidity and with an accuracy of finish impossible with machines in which two part molds are used. Patents on this machine have also been taken out in England and France, through the Scientific American Patent Agency.]

1,229.—T. C. Hargrave (assignor to H. M. Crane), of Schenectady, N. Y., for an Improvement in Harvesting Machines:

I claim having the driving shaft, D, arranged in an inclined position as shown and described, so that a toothed wheel, E, of larger diameter than the driving wheel, B, may be employed on said shaft, all as set forth, for the purposes specified.

[This invention has for its object the transmission of the power from the driving wheel to the sickle in the most direct and simple manner possible, so as to avoid complexity and consequent friction; also, the attaching of the finger bar to the main frame in such a way that, by a very simple arrangement, the finger bar and sickle may rise and fall at either end and conform perfectly to the inequalities of the surface of the ground, and the finger bar and sickle raised by the driver at any time so as to pass over any obstacles that may lie in its path.]

1,230.—Wm. H. Hope, of Washington, D. C., assignor to T. B. Florence, of Philadelphia, Pa., for an Improvement in Street Cleaning Machines:

I claim, first, The peculiar construction and arrangement of the shovels or scrapers, s, as described, in combination with the endless apron or conveyor, c, frame, F, and lever, L, for the purposes specified.

Second, The combination with the hinged frame, F, and hinged bottoms, B B, of the levers, L and l, the latch, spring and cord, or its equivalent, constructed and arranged in relation to the driver's seat, in the manner and for the purpose specified.

1,231.—J. J. McCormick, of Paterson, N. J., assignor to himself and J. L. Canfield, of New York City, for an Improved Spring Bed Bottom:

I claim the employment of the cushion, C, in combination with the spring, A, and screw, a, substantially as described, and for the purpose specified.

1,232.—John Shinn, of Leverington, Pa., assignor to himself and B. H. Jenks, of Bridesburg, Pa., for an Improvement in Looms:

I claim, first, Constructing each jack in such a manner that after having given a full movement to the heddle in either direction, up or down, it will be held in that position independent of the others until relieved by the pattern cylinder or chain, as described.

Second, I claim making the edges of the blades on the jacks inclined or beveled from the center out to each end, so that by pressing one end of the blade into the jack, the other end from the center out will form an inclined plane, and force the needle out to be ready for the next movement of the cylinder or chain.

1,233.—S. W. Warren, of Brooklyn, N. Y., assignor to himself, T. C. Banks and John Thompson, of New York City, for an Improved High and Low Water Indicator for Steam Boilers:

I claim, first, The siphon pipe, e, in combination with the expansion pipe, B, arranged in the manner and for the purposes set forth.

Second, I claim introducing the pipe, d, into the steam boiler at the level of the greatest hight to which the water is to be supplied so as to produce a high water indicator by the circulation of hot water through the expansion pipe, B, for the purposes set forth.

Third, I claim the arrangement of the glass indicating gage, f, and valves or cocks, n n, in combination with the pipes, d and B, for the purposes set forth.

1,234.—J. S. Butterfield, of Philadelphia, Pa., for an Improvement in Breech-loading Ordnance:

I claim, first, The combination of the pivoted barrel, A, solid bed and breech-piece, B J, and pivoted lock-piece, C, constructed, arranged and operating substantially as and for the purpose set forth.

Second, The combination of the taper-ended breech screw, F f', pivoted barrel, A, perforated lock-piece, C D, and solid bed and breech, B J, in the manner and for the purposes shown and explained.

LIST OF CLAIMS FOR THE WEEK ENDING MAY 7, 1861.

1,235.—Samuel Comfort, Jr., of Morrisville, Pa., for an Improvement in Sewing Machines:

I claim imparting tension to the needle thread, for producing the necessary tension on the same, by means of a coiled or other suitable spring, f, a bar, G, or its equivalent, and the pillar, I, or other suitable stationary object, when the fulcrum of the said bar, the thread guide on the same, that part of the bar acted on by the spring, and the orifice in the pillar for the passage of the thread are so situated in respect to each other and to the direction taken by the thread itself, that any retarding of the latter or interruption of its progress towards the frictional surface, will remove the friction caused by the bar, as set forth.

I also claim the combination of the spring, T, with the discoidal shuttle, when the said spring is so situated in respect to the orifice, v, and in respect to the direction of the thread from the shuttle spool to the fabric, that any retarding or interruption of the free passage of the thread from the spool will be the cause of removing the friction on the thread between the spring and case, as specified.

1,236.—W. P. Craig, of Newport, Ky., for an Improvement in a Cotton Press:

I claim the peculiar arrangement of traveling box and follower, C c e D d d, toggie arms, E E, screw shaft, G g g, and spring, H; the whole being combined and adapted to operate substantially as set forth.

1,237.—Joseph Dalton, of Brooklyn, N. Y., for an Improvement in Knitting Machines:

I claim the stationary upright cylinder with the needles fixed thereto at equal distances from, and parallel to each other, combined with the feeding and clearing apparatus revolving around and within said cylinder.

I also claim the bent lever, V, in combination with the cam, m, and feeding apparatus.

I also claim the peculiar shape of the cloth presser or slide, P, combining the double duty of equalizing the strain and carrying the cloth below the barbs of the needles, all substantially as described and for the purpose set forth.

1,238.—G. R. Dean, of Mayville, N. Y., for an Improvement in Printing Presses:

I claim the arrangement of the roller levers, H H, roller, J, arms, c c, type roller, rotary inking table, D, bed, C, lever, F, and rod, G, with each other and with the hinged impression levers, B L, in the manner and for the purpose shown and described.

1,239.—D. H. Dotterer, of Memphis, Tenn., for an Improvement in Journal Boxes:

I claim, first, The employment in combination with a journal box, A, axle, C, and revolving sheave or pulley, D, of an endless metallic band, F, which serves as an anti-friction bearing for the journal of a car axle, also as a spring cushion for the same, and likewise as a means for elevating the lubricating or cooling material to the wearing surfaces, substantially as described.

Second, In combination with the band, F, pulley, D, journal box, A, and journal, C', the end-sliding block, a, in the manner and for the purpose described.

1,240.—Henry Fisher, of Alliance, Ohio, for an Improvement in Mowing Machines:

I claim, first, The combination of the projecting standards, L L, and adjustable pivoted handles, M M', when used in connection with a finger bar, P, located in the rear and extending on one side of the driving wheel, A; all as shown and described, and for the purposes explained.

Second, The lock joint at the outer end of the finger bar formed of the shoe, T, flanges, t t', track clearer, Q, and screw, U, constructed and applied in the manner and for the purposes explained.

1,241.—Alexander Frey, of New York City, for an Improvement in Looms:

I claim, first, The combination of a plate, a, carrying the bobbins or spools with the guide plate, b, and rollers, c, applied to a loom in the manner and for the purposes specified.

Second, I claim the corrugated let-off and take rollers, d d and g g, connected together by the chain, 2, or its equivalent, and causing the warps and cloth to progress regularly through the loom as the weaving is performed, as specified.

Third, I claim the arrangement of the driver's seat, t, and levers, u, acted upon by the cams, 10, in the manner and for the purposes set forth.

1,242.—Emerick Gordon and Jacob Dunn, of Albany, N. Y., for an Improvement in Trusses:

I claim, first, The combination of the arm, C, with the pad, L, adjustable by the screws, b b', operating together with slot, e e, to regulate the relative positions of the arm and the pad to each other.

Second, The combination of the spring, H, formed as described, with the adjusting screw; the whole attached to a truss, substantially in the manner and for the purposes set forth.

1,243.—Earl Guyer, of Wolcott, Vt., for an Improved Vegetable Cutter:

I claim the dividing bar, H, horizontal double-edged knife, D, in combination with the two sets of angular, slotted, adjustable knives, E E', in the manner and for the purpose described.

1,244.—Frederick Heidrick, of Philadelphia, Pa., for an Improvement in Lamps:

I claim so arranging said sheaths that the outside one will come up even with the top of the wick tube, and the top of the second a little below that of the first, in the manner and for the purpose specified.

1,245.—Elisha Hughes, of McCartysville, Cal., for an Improvement in Making Mining Picks, &c.:

I claim the construction of mining picks and mattocks with an eyed adjusting and holding rod, E, a blade notched as at a b, ferule, C, and terminal nut, d; the whole arranged and operating in the manner and for the purpose shown and described.

[This invention relates to an improved mode of attaching the tool to the handle, whereby many advantages are obtained over the ordinary mode of attachment.]

1,246.—William Jackson and Joseph Clarke, of Syracuse, N. Y., for an Improved Churn:

We claim the employment of the disks, A and B, with their concentric rows of teeth, as specified, in combination with the central wheel, C; the whole constructed and operating as described, for the purpose set forth.

1,247.—J. M. May, of Janesville, Wis., for an Improvement in Pumps:

I claim, first, A piston made with one or more grooves or holes in the side thereof, in combination with a sliding ring to open and close alternately induction grooves or holes as the pump is operated, and a cylinder without induction aperture in its bottom, when a piston, a ring and a cylinder are constructed and arranged relatively to each other substantially as and for the purpose described.

Second, A set screw or pin passing through the side of a cylinder, with its point extending into, and fitting easily a longitudinal groove or channel in a piston, when used to connect a cylinder and piston, and regulate the stroke of a pump, substantially as described.

Third, A toggle joint, or its equivalent, in combination with a rod or base, M, cylinder, A, piston, B, and eduction pipe, I, when constructed substantially as and for the purpose described.

1,248.—A. L. Mowry, of Cincinnati, Ohio, for an Improvement in Annealing Car Wheels:

I claim the employment of charcoal or other equivalent combustible substance inlaid between the wheels in a pit, in combination with an aperture, d, for regulating the supply of air to the same, so as to prolong the combustion of the fuel and retain the heat, for the purpose described.

1,249.—J. S. Peaslee, of Providence, R. I., for an Improvement in Washing Machines:

I claim the combination of the elastic pounder, D E, constructed substantially as described, with the secondary spring bottom, F F, provided with the elastic pins, e e, such combination affording two yielding surfaces between which the clothes to be washed are acted upon, substantially as specified.

1,250.—Van Buren Ryerson, of New York City, for an Improvement in Method of Distillation:

I claim the distillation of substances by superheated steam applied to the liquid to be distilled while it is in a spray, substantially as and for the purpose specified.

I also claim the mode of fractional distillation described, consisting in the exposure of the liquid to be distilled, in the form of spray, successively to successive portions of superheated steam of gradually increasing temperatures.

1,251.—Gottlieb Schreyer, of Columbus, Ohio, for an Improved Mode of Making the Skeins of Axle Arms for Carriages:

I claim, as a new article of manufacture, an axle skein with its under wearing surface, a a a, and its smallest end, e d d, made of an uniform thickness, as shown in Figs. 5, 6 and 7, and its upper surface, f f, of a gradually decreasing thickness, as represented in Fig. 8, by forging or rolling a plate of metal, A, in the manner and for the purpose described.

1,252.—S. J. Seely, of Brooklyn, N. Y., for an Improved Mode of Constructing Iron Buildings:

I claim constructing dwelling and other houses of corrugated metal plates, as set forth.

1,253.—J. G. Treadwell and William Hailes, of Albany, N. Y., for an Improvement in Stoves:

We claim, first, The combination of the contracting circular ring or diaphragm, c, the inverted frustum, H, and the metallic ring, d, when the same are used as and for the purpose set forth.

Second, In combination with the subject of the first claim, we claim a continuous or circular combustion chamber, between the fire pot and supply cylinder, arranged with two or more descending flues, as and for the purpose specified.

Third, The employment of the covers, a e, the cap price, m, and the rod, n, constructed, arranged and used as and for the purpose specified.

1,254.—Samuel Wagner, of York, Pa., for an Improved Artificial Honeycomb:

I claim, as a new article of manufacture, an artificial substitute for the central division of comb built by bees, which presents to them, on both sides thereof, guides for the construction or continuation of the sides of the comb cells, whether the same is constructed with or without the whole or any portion of the sides of the cells.

1,255.—F. R. Walker, of Waterford, Pa., for an Improvement in Beehives:

I claim, first, The arrangement of the pins, h i and k', in combination with the supporting frome, j k k, and comb frames, C, the whole being constructed and employed in the manner shown and explained, to permit the comb frames to swing or secure them in position without exposing the pins.

Second, The wires or comb guides, D, attached to the under sides of the top pieces, l, of the comb frames, as and for the purpose specified.

[The object of this invention is to pivot the comb frames in the hives in such a manner that the pivots will not be accessible to the bees, and the latter be thereby prevented from covering the pivots with wax, a contingency which prevents the swinging out of the comb frames when it is desired to examine the combs and remove portions or the whole of the same. The invention also has for its object the swarming of bees direct from one hive into another, and also the aiding of the bees in guiding the comb during its construction, so that the latter will be built in the same planes with the frames, and the combs of the several frames kept separate.]

1,256.—W. E. Watters, of East Bend, Ky., for an Improvement in Pumps:

I claim, first, A double-acting pump, its cylinder having no other opening to its interior than that through which the tubular piston rod works, and having no valves other than those contained within the piston itself.

Second, The induction pipe, inclosing the discharge pipe, both being attached to the piston (or a part thereof) and together serving the purpose of the piston rod, substantially as described.

Third, The double-acting ring valve, n, for alternately closing the passages, k, and the apertures in the cap, m, in combination with the induction pipe, substantially as described.

Fourth, Forming the induction valves by the pieces, h and m, closing respectively against the internal flange of the piece, f, and the disk, g, substantially as described.

Fifth, The several parts composing the piston and its valves, viz.: the external ring, f, the perforated disk, g, the piece, h, with its spaces and passages, and its connection with the suction and discharge pipes, and the flat double-acting valve ring, n, in combination, for the purposes and substantially as described.

1,257.—J. H. Weaver, of Baltimore, Md., for an Improvement in Burial Cases:

I claim the intermediate hinged and lock-furnished glass cover, b, when it is protected by the exterior hinged and lock-furnished solid cover, c, substantially in the manner set forth.

1,258.—D. M. Edwards, of New York City, and Joseph Horner, of New Brunswick, N. J., for an Improvement in Windlasses:

I claim the arrangement of the combined differential ratchet wheels, D D', pawl, a, and pawled lever, G, with the ratcheted drum, E, pawl, b, and shaft, B, in the manner and for the purpose shown and described.

[The object of this invention is to obtain a windlass which may be used for twisting different articles at the same time, said articles being so connected with the windlass that all may be elevated simultaneously or any one of them separately, as may be desired, without affecting the others.]

1,259.—E. G. Hall (assignor to himself and W. F. Drake), of New York City, for an Improved Nail Machine:

I claim the employment of the transversely sliding bed-knife or knives, G H, in combination with the revolving cutter, 1 2 or 1 2 3 4, substantially as and for the purpose set forth.

1,260.—J. G. Holt (assignor to O. G. Langi and C. B. Brown), of Chicago, Ill., for an Improvement in Casting Thimble Boxes:

I claim a new article of manufacture produced by a new method, to wit, a seamless thimble box for the axles of wagons and other vehicles, with two internal projecting end bearings, produced by using, in combination with the ordinary pattern flask and sand core, an inner end bearing pattern made in two or more pieces, substantially as and for the purposes set forth.

1,261.—Andrew Morse (assignor to himself and Ira Winn), of Portland, Maine, for an Improvement in Extension Platforms:

I claim the arrangement of the pulley standard, B, radiating sliding blocks, C, and rails, A, with the joint levers, D D, pulley blocks, a, hub, K, and cord, E, and windlass, H J, all in the manner and for the purposes shown and described.

[The object of this invention is to obtain a more convenient mode for raising and lowering a platform, such as are used in cellar ways and hatchways of store houses for raising and lowering goods from one story to another.]

1,262.—James Pine (assignor to himself and J. J. Viele), of Troy, N. Y., for an Improvement in Rakes for Harvesters:

I claim the employment or use of the endless straps, chains or cords, L M c d f, when arranged with the plates, I I', and guard board, g, on the platform, E, to operate substantially as and for the purpose set forth.

1,263.—James Pine (assignor to himself and J. J. Viele), of Troy, N. Y., for an Improvement in Harvesters:

I claim the combination of the perforated bar, K, and link, g, attached to the tongue, C, and gear frame, D, in the manner shown and explained, and employed in connection with an adjustable double-tree to vary the upward draft applied to the finger bar without changing the angle of the said bar.

1,264.—Suspended.

1,265.—William Graichen and Charles Hoffman, of Clinton, Mass., for an Improvement in Looms:

We claim, first, The vibratory hooks, s, operating in connection with the rock-shaft, G, and arms, q, or their equivalents, in manner substantially as and for the purpose set forth.

Second, The combination of the levers, H K and M, spring shipper, N, bar, L, cams, E, and stops, F, constructed, arranged and operating in the manner and for the purposes set forth.

RE-ISSUES.

72.—W. H. Seymour, D. S. Morgan and Aaron Palmer, of Brockport, N. Y., and S. G. Williams, of Janesville, Wis., assignees of Wm. H. Seymour, of Brockport, N. Y., for an Improvement in Reaping Machines. Patented July 8, 1851:

We claim a quadrant-shaped platform, arranged relatively to the cutting apparatus substantially as described, for the purpose set forth.

73.—R. F. Loper, of Philadelphia, Pa., for an Improvement in Ship Building. Patented Nov. 13, 1847:

I claim constructing ships and other vessels by combining iron hollow forms of ribs or timbers, with wooden sides, bottom, keel, stem and stern posts, substantially as described.

74.—G. M. Selden, of Troy, N. Y., assignee of D. S. McNamara, of North Hoosic, N. Y., for an Improvement in Harvesters. Patented Sept. 28, 1858:

I claim, first, So constructing the main frame of a grain and grass harvester, or either, as that the rear of the frame, together with the front outer corner, will be elevated above the ground to pass freely over cut grass and other obstructions, while the front inner corner of said frame is depressed down near to the ground to receive and support the shoe which supports the heel of the finger beam, as set forth, and whereby the position of the driver can be placed well back of the cutting apparatus, thus enabling him to keep a constant watch over the same without danger of falling in front of the cutters, should he be thrown from the machine.

Second, I also claim the combination of the pieces, B C D and E, when arranged in relation to each other as and for the purposes stated.

Third, I also claim the combination of the truss rods, C', with the pieces, C and E, substantially as and for the purposes set forth.

Fourth, I also claim the truss rod, B', with the frame pieces, B C D and E, substantially as and for the purposes set forth.

Fifth, I also claim the combination with the finger beam, F, of the pieces, E E', and truss rod, C', or its equivalent, substantially as and for the purposes set forth.

Sixth, I also claim the combination of a metallic guide piece, n'', with arm, n, and cutter bar and pitman, substantially as set forth, whereby the heel of the cutter bar is left free and uncovered so as to avoid clogging, and yet is kept in place as described.

Seventh, I also claim the combination of stationary journal piece, a, with the main frame and drive wheel, substantially as set forth, whereby the frame is not only strengthened, but depressed toward the ground, although a wheel of large size is used.

Eighth, I also claim the combination of the lever, 4', spring, 7, and staple, 8, with journal piece, a, and shaft, d, for the purposes set forth.

Ninth, I also claim the combination of the crosspiece, S S', and springs, L'' L''', with seat, L, constructed and arranged in relation to each other as set forth.

Tenth, I also claim the combination of the slotted tracker board, N,

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with the bent tracker iron, N′, and set bolt and nut, N″, substantially as and for the purposes set forth.

Eleventh, I also claim the combination of metal piece, q′, bolt, q, with shoe, G′, and finger beam, as and for the purpose set forth.

Twelfth, I also claim forming the metal shoe, G′, substantially as described and shown in the drawings, whereby the piece, E, can be securely fastened to its side, so as to have a support both in front and rear of the end of the finger beam, and the inner inclined part, R, made to afford a proper support to the tracker, while the part, x, affords an even metallic surface upon which the arm, r′, and end of the cutter bar hinged thereto can vibrate when the machine is in operation.

Thirteenth, I also claim shoe, G, for supporting the heel of the finger beam or bar, constructed as shown and described, whereby its union with the main frame and finger beam is rendered simple and strong, and in such a manner as to afford a proper metallic support to the pivot of the rear end of arm, n.

Fourteenth, I also claim the curved metallic finger bar, extension piece, F′, in combination with shoe, G, and the front outer corner of the main frame, whereby the finger bar is strengthened and the crank end of the pitman protected from cut stalks of grass.

75.—G. M. Selden, of Troy, N. Y., assignee of D. S. McNamara, of North Hoosic, N. Y., for an Improvement in Harvesters. Patented Sept. 28, 1858:

I claim, first, The combination and arrangement with a hinged tongue or draft beam of a grain or grass harvester, of a lever or lifting device in such a manner as that when the upper end of the lever is drawn back by the driver, the cutting apparatus will be raised by the other end of said lever above the ground and be suspended from the tongue, substantially as described.

Second, I also claim the combination of a right-angled lever with the rear side of a hinged tongue of a grass harvester, and so connected with the shoe which supports the heel of the finger beam and cutter bar as that when the long arm of said lever is drawn back by the driver, the power will be communicated from the short arm of said lever to said shoe, causingit, together with the cutting apparatus, to be raised or elevated above the ground, and suspended from the tongue for the purposes stated.

Third, I claim the combination of finger beam, F, shoe, G, adjustable connection, I″, lever, I, and hinged tongue, or their equivalents, substantially as described.

76.—G. M. Selden, of Troy, N. Y., assignee of D. S. McNamara, of North Hoosic, N. Y., for an Improvement in Harvesters. Patented Sept. 28, 1858:

I claim, first, The combination of the following elements in a grain or grass harvester, viz: a main frame, a hinged tonged and two lever arrangements, whereby the driver, from his seat on the machine, can use his feet or his hands, or both, to raise the cutting apparatus and suspend the same from the tongue, for the purpose of passing over cut grass or obstructions in the pa h of the machine.

Second, I also claim the combination of lever, J J′, with the slotted lever, I, substantially as and for the purposes stated.

Third, I also claim the combination of levers, J J′ and I, and the hinged tongue, H H′, connection, I, lever, K, and stop piece, K′, substantially as set forth.

Fourth, I also claim the combination and arrangement with the main frame of a grass harvester and a hinged tongue, to the rear of which is fulcrumed a lever for raising the finger bar by a backward motion of the driver, of a stop, in such a manner as that when the finger beam is raised above the ground, its weight thus raised will be borne by the tongue, while the strain due to holding said lever back will be borne by the main frame to which the stop device is hinged.

Fifth, I also claim the combination with the main frame of a grass harvester or mowing machine, of a hinged tongue having a lever fulcrumed to the rear inner side thereof, together with a seat for the driver; the latter being so arranged that the position of the driver will be over the rear of the main frame, and so that he can use his right hand to draw the lever back by a direct backward motion of his arm or body, or both, thus raising the cutting apparatus, while the reins are kept fast and taut in the other hand, and the team under full control.

77.—G. M. Selden, of Troy, N. Y., assignee of D. S. McNamara, of North Hoosic, N. Y., for an Improvement in Harvesters. Patented Sept. 28, 1858:

I claim, first, The combination of the following elements in a grass harvester, viz: a main frame, a hinged tongue, to the rear inner side of which is pivoted a lever and a cutting device, arranged in such relation to the main frame as that the front of the shoe which supports the heel of the finger beam will project forward beyond or in advance of the front of the main frame, so as to permit of a free up and down motion in advance of the inner front corner of the main frame of the connection which connects the shoe with the lifting device or lever whose fulcrum or journal is on the rear of the hinged tongue.

Second, I also claim the combination and arrangement of the main frame which supports the crankshaft, and the shoe which supports the heel of the finger beam and cutter bar, and the hinged tongue by which the machine is drawn, in such a manner as that the end of the pitman which connects the crankshaft will work in front of the front outer end or corner of the main frame, which is elevated above the ground, while the other end of the pitman which is connected with the heel of the cutter bar will incline down in front of the inner front corner of the main frame to the shoe which supports the heel of the finger beam, and which shoe is depressed below the front outer corner of the main frame, and supported so as to run on the ground, whereby the crank end of the pitman is elevated above obstructions, and at the same time, its motions are not obstructed or interfered with by the front of the main frame on the rear of the hinged tongue under which it works.

Third, I also claim the combination with the main frame of a grass harvester of a hinged tongue or draft beam, and a metallic shoe to support the heel end of the cutter bar and finger beam, substantially as set forth; that is to say, so that the hinge of the tongue will be in rear of the pitman which operates the sickle bar, while the front end of the shoe extends forward and is connected to an adjustable lifting connection which works in front or advance of the pitman, in combination with a right-angled lever or its equivalent fulcrumed to the rear inner side of said tongue.

Fourth, I also claim so arranging a right-angled lever fulcrumed on the rear inner side of a hinged tongue of a mowing machine as that its horizontal arm will project forward as far, or nearly so, as the front of the shoe which supports the heel of the finger beam, so as to prevent undue twisting of the parts or the adjustable connection by which they are connected when the driver is raising the cutting device.

DESIGNS.

S. W. Gibbs (assignor to J. F. Rathbone), of Albany, N. Y., for a Design for a Stove.

S. W. Gibbs (assignor to J. F. Rathbone), of Albany, N. Y., for a Design for a Parlor Stove.

S. W. Gibbs (assignor to J. F. Rathbone), of Albany, N. Y., for a Design for a Cooking Stove.

C. W. Palmer, of Troy, N. Y., for a Design for the Oven of Cooking Stoves.

H. G. Thompson, of New York City, assignor to the Hartford Carpet Company, for a Design for a Carpet (11 cases).

Hiram Young, of New York City, for a Design for a Teapot.

THE CAUSE OF DELAY IN THE PUBLICATION OF CLAIMS.

The foregoing list of claims, for the weeks ending April 30th and May 7th, contains all the patents, not previously published, issued up to the latter date. The claims granted on the 14th and 21st of May had not been received at the time of our going to press, although we have a list indicating what patents are granted, and have assurances that the claims will be sent to us in time for our next issue.

The cause of delay at the Office in furnishing to us the list of claims for a few weeks past as punctually as usual, has been owing to the adoption of the printing system by the Office, it being necessary that the patents be withheld from delivery until the contents were set up and printed, and the proof compared with the copy, so that no errors might occur in the printed copies; such care is necessary, as these printed copies are to be certified to by the Commissioner as correct copies of the original patent, so that they may be used in court in place of certified written copies, which have been heretofore used.

As soon as this new printing system gets well to work, the patents, we are assured, will not be withheld beyond the date of issue.

Notes and Queries

E. G., of Ohio.—Direct your communication to G. W. Beardslee, College Point, L. I., and you will obtain the information desired respecting the price of his magneto-electric machines.

J. B. C., of Ill.—The application of a percussion cap on a nipple at the point of an elongated iron shell is an idea, we believe, almost as old as the invention, and there are several models of bomb-shells in the Patent Office constructed in this way.

M. T. R., of N. Y.—In the year 1850, experiments were made at Woolwich, England, with india-rubber as a protection for iron plates against the effects of artillery. You will find a description of these experiments on page 62, Vol. VI. (old series) of the SCIENTIFIC AMERICAN.

S. McQ., of Ill.—The water in your cistern must contain organic matter in solution, or it would not ferment. Filtration through charcoal will not purify it perfectly. The following is the best method we can recommend you to pursue:—Take about half a pint of fresh slaked lime, stir it up in a gallon of water in a pail, then pour it into your cistern, stir up the water, allow it to settle for five hours, and use the clear.

E. M. F., of Pa.—In the London *Mechanics' Magazine*, page 376, you will find the diagram of a rifle bore with grooves similar to those in the sketch which you have sent us.

W. F. Q., of Del.—We regret that we cannot discover any thing patentable in your inventions. The use of several cylinders for one revolver is an old idea, and the manner in which you provide for such use is old. The vitriol bottle was proposed, if not invented, by John Mitchell, one of the leaders in the so-called Irish rebellion of 1848. Your projectile is also old, including the spiral fins. It is not necessary to make a flying model of the aerial machine, but only one which illustrates the construction.

D. H., of Ky.—Explosive projectiles containing molten iron are an old invention. A. M. George obtained a patent in this country in 1856, for an improvement in such projectiles. We do not know whether they have ever been used in actual warfare, but it has been proposed to throw them from the new iron-plated war ships constructed by the French and British governments.

B. B., of Ohio.—Your idea of injecting hot water from the boilers of a steamer into an enemy is not new. It was, some years ago, very successfully used by a British vessel among a swarm of pirates in the China seas, and the vessel and crew were saved by it. The Vanderbilt steamships, carrying the California mails and treasure, are fitted up with hose for this purpose, and will thus be enabled to give a warm reception to any of the privateers of the C. S. A.

D. C., of Mass.—The best book of receipts for drying wool is Smith's—a London publication. It contains some defects, but is the best in print, so far as we know. Can be obtained of Balliere & Brothers, of this city.

W. G. S., of Ohio.—You can determine a genuine wire twist from a fictitious twist of gun barrels by scouring a piece of the barrel and testing it with sulphuric acid. If genuine, the twists will show dark and light streaks.

A. W. M., of N. J.—Common lime, mixed with skimmed milk, will answer fully better for the whitewash of barns than water, lime and milk. The latter is more liable to crumble and rub off.

D. E. S., of N. Y.—Boil the berries and buds of sumac for the purpose of making a black stain with copperas in solution.

E. W. K., of N. Y.—We have known of roofs being made of what is called galvanized sheet iron—that is, iron plated with zinc. It was corrugated and laid with the grooves running down the roof, the plates being lapped on each other like shingles. It made a good roof.

MIXTER, of Mich.—The objection to green hickory for cogs for spur wheels would be the shrinking as the wood seasoned, thereby loosening the cogs.

O. J. P., of C. E.—For a steamboat 30 to 36 feet long, you had better have a high pressure engine with one cylinder, and a very simple boiler. A boat of this size will not, however, carry an engine large enough to propel it with sufficient speed for a pleasure boat especially if accommodations are also provided for passengers.

B. D. B., of N. H.—We think that steel hardened and then tempered to a blue color, will not be softened by being again heated to a lower temperature. We suggest to you that the most satisfactory way to determine such a fact is to try the experiment.

T. P., of N. Y.—We were not aware that you were the inventor of stamping porcelain articles dry. We have seen the operation performed at the manufactory at Green Point.

G. M. H., of Mass.—Henry Carey Baird, of Philadelphia, is publisher of the "Practical Distiller," which may contain all the information you desire about the "yeast."

SUGGESTION, of Pa.—You will find the questions, "In what Consists a Nation's Wealth?" and "What Makes and Keeps it Prosperous?" treated in articles on pages 25, 28, 36, 58, 89, 106, 122, 234, 249, 265 of our current volume.

T. J. L., of R. I.—You will find the recipe for the cure for drunkenness on page 279 of the current volume.

Money Received

At the Scientific American Office on account of Patent Office business, from Monday, May 13, to Wednesday, May 22, 1861:—

G. R., Jr., of Ind., $15; C. L., of Cal., $10; E. B., of Mich., $25; L. S. F., of N. Y., $15; G. G. G., of Conn., $25; T. C. H., of N. Y., $15; T. K. A., of N. Y., $25; L. B. S., of Conn., $25; M. La R. H., of Iowa, $15; J. L. T., of N. Y., $15; H. J. H., of Ill., $10; C. A. C., of Mich., $30; D. L., of Vt., $25; R. H. J., of Iowa, $25; S. Z. S., of Pa., $25; C. & P., of Ill., $20; L. S. B., of N. Y., $20; R. P., of Iowa, $20; S. R. W., of N. Y., $20; J. M. O., of N. Y., $25; J. K., of Ind., $10; J. D., of N. H., $25; W. C. F., of Maine, $25; M. M. P., of Vt., $25; W. D., of R. I., $35; J. O. F., of Mass., $20; J. M. O., of N. Y., $40; P. R. C., of N. Y., $8; A. C. C., of R. I., $12; L. A. B., of N. Y., $30; J. H., of Pa., $15; A. W. R., of N. Y., $20; J. C., of Pa., $15; G. M., of Conn., $15; A. B., of Va., $25; G. D. & H., of N. Y., $15; N. C. S., of Conn., $20; M. A. S., of Ill., $20; L. M. J., of N. Y., $20; L. C., of N. Y.. $10 J. E. D., of N. H., $25; T. G. E., of Maine, $50; C. W. S., of Maine, $25; J. A., of Conn., $25; H. K., of Conn., $15; W. H., of Pa., $15; A. H. Van G., of N. J., $10; M. L. P., of Ind., $25; M. S. G., of Wis., $23; J. F. & W. L. B., of Ill., $15; P. T., of N. Y., $20; R. & H., of N. Y., $35; L. H. A., Mass., $20; M. C. B., of N. H., $20; T. A., of N. Y., $12; S. M. S., of Iowa, $50; E. B., of N. Y., $10; S. N., of Conn., $15; G. & C., of Iowa, $25; G. S., of N. Y., $20; F. & S., of N. Y., $20; C. B., of N. Y., $35; ●. H. Van G., of N. J., $12; H. P., of Ohio, $25; R. & McC., of N. Y., $25; S. D. C., of Conn., $30; S. W., of Mass., $43; J. A. & A. S. H., of Ill., $17; N. H. B., of Mass., $15; G. W. R., of N. Y., $20; J. S. S., of N. Y., $40; B. T. W., of Wis., $25; E. G., of Mass., $25; G. N., of N. Y., $25; T. W., of N. J., $25; J. A., of Pa., $15; L. S., of N. Y., $15; R. K., of Mass., $20; N. L. A., of N. Y., $20; M. & K., of N. J., $25; C. H. L., of R. I., $25; R. W., of Ill., $25.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Monday, May 13, to Wednesday, May 22, 1861:—

R. & H., of N. Y.; G. G. G., of Conn.; C. W. S., of Maine; P. W. B., of Cal.; C. L., of Cal.; T. A., of N. Y.; A. K. T., of Mich.; J. K., of Ind.; J. A., of Conn.; W. C. F., of Maine; J. E. D., of Mich.; F. & G., of Cal.; J. M. O., of N. Y.; H. L. A., of Wis.; A. C. C., of R. I., M. M. P., of Vt.; T. G. E., of Mo. (2 cases); J. S. S., of N. Y.; E. B., of Mass.; J. D., of N. H.; D. L., of Vt.; T. K. A., of N. Y.; C. B., of N. Y.; N. H. B., of Mass.; A. B., of Va.; J. S. J., of N. Y.; L. S. F., of N. Y.; S. M. S., of Iowa (2 cases); B. T. W., of Wis.; S. D. C., of Conn.; S. Z. S., of Pa.; J. C. B., of N. Y.; S. W., of Mass. (2 cases); G. & C., of Iowa; T. G. E., of Mo.; M. L. P., of Ind.; M. & K., of N. J.; ●. H. Van G., of N. J.

CHANGE IN THE PATENT LAWS.

NEW ARRANGEMENTS—PATENTS GRANTED FOR SEVENTEEN YEARS.

The new Patent Laws, recently enacted by Congress, are now in full force, and promise to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for Design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees, at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time, and on the most liberal terms.

Testimonials.

The annexed letters, from the last three Commissioner of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

MESSRS. MUNN & CO.:—Gentleman: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge

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we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent, &c., made up and mailed to the Inventor, with a pamphlet, giving in structions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. Over 1,500 of these examinations were made last year through this Office, and as a measure of prudence and economy, we usually advise Inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row New York.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention, if susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition is composed, for the Patent Office. These should be securely packed, the Inventor's name marked on them, and sent, with the government fee, by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO No 37 Park-row New York.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, inclosing the official letters, &c.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our Branch Offices.

Interferences.

We offer our services to examine witnesses in cases of interference, to prepare arguments, and appear before the Commissioner of Patents or in the United States Court, as counsel in conducting interferences or appeals.

For further information, send for a copy of "*Hints to Inventors.*" Furnished free. Address MUNN & CO., No. 37 Park-row, New York.

The Validity of Patents.

Persons who are about purchasing Patent property, or Patentees who are about erecting extensive works for manufacturing under their Patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing Patent, before making large investments. Written opinions on the validity of Patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars, address MUNN & CO., No. 37 Park-row, New York.

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Valuable Patents are annually expiring which might be extended and bring fortunes to the households of many a poor Inventor or his family. We have had much experience in procuring the extension of Patents; and, as an evidence of our success in this department, we would state that, in all our immense practice, we have lost but *two* cases, and these were unsuccessful from causes entirely beyond our control.

It is important that extension cases should be managed by attorneys of the utmost skill to insure success. All documents connected with extensions require to be carefully drawn up, as any discrepancy or untruth exhibited in the papers is very liable to defeat the application.

Of all business connected with Patents, it is most important that extensions should be intrusted only to those who have had long experience, and understand the kind of evidence to be furnished the Patent Office, and the manner of presenting it. The heirs of a deceased Patentee may apply for an extension. Parties should arrange for an application for an extension at least six months before the expiration of the Patent.

For further information as to terms and mode of procedure in obtaining an extension, address MUNN & CO., No. 37 Park-row, New York.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the nventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

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TO OUR READERS.

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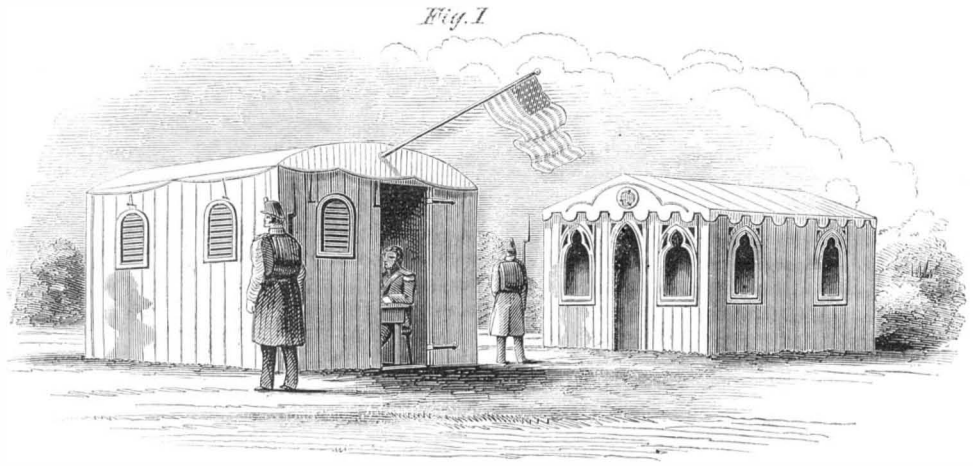
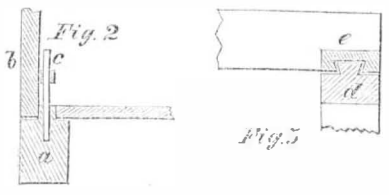
Fig. 1



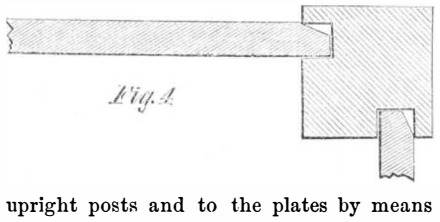
DERROM'S IMPROVED PORTABLE CAMP HUT.

with armies were it not for their great weight. As our soldiers will move mostly along lines of railroad or of navigable waters, it is thought that they might take portable huts with them, if made very light and in a way to be quickly put up and taken down. To meet this want, Mr. A. Derrom, of Paterson, N. J., has contrived the hut illustrated in the accompanying engravings.

It is made of thin pine boards, about three-eighths of an inch in thickness, formed into panels, which are secured to a light frame also of pine. The several pieces of the frame are connected together by dovetail



oints, very similar to those employed for joining the pieces of a bedstead together. Fig. 3 of the cuts shows the mode of fastening the frame together, *d* being the upright post at the corner and *e* the plate which rests upon it. Fig. 2 represents the mode of securing the side panels to the sill; *a* is the floor, the sides and *c* the bolt. The panels are secured to



the upright posts and to the plates by means of grooves in the posts and plates into which the edges of the panels are introduced, as shown in Fig. 4, which represents a corner post; the panels entering at right angles, making the frame exceedingly stiff and perfectly perpendicular to the floor. This mode of fastening, while it is very secure and stiff, enables the hut to be put up or taken down in a few minutes. The material is also easily packed for transportation, as no piece weighs more than 25 pounds. All the parts, sills, posts, plates, shutters, doors, flooring, &c., are cut and fitted by machinery to one size, so that any piece made for No. 1 will fit, and may be used in any other number.

Huts may be made on this plan of any size from that of a watch box to that of a church, and of any geometrical form. By removing the panels from one or two sides, several huts may be arranged to form one large room, either square, T-shaped, L-shaped or cruciform. They can be covered with canvas, or with boards and any of the cheap roofing cements. They can be supplied with windows and ornamented to any extent desired, constituting not only a comfortable and healthy, but a neat and convenient dwelling.

This hut is not designed to supersede tents for a flying camp for troops on the march; but for permanent or temporary camps to be occupied either for a few days or for several months, it is claimed to be on the whole decidedly superior to canvas. It has also peculiar advantages for hospital purposes; affording so much better protection from heat, cold and dampness, and being susceptible of any degree of ventilation.

Besides its use for military purposes this cottage is admirably adapted to many uses in civil life. As a temporary habitation at the seashore, or in country places, it will frequently be found far cheaper, more comfortable and more agreeable in every respect than the small rooms of crowded hotels. It will also be convenient for railroad or other contractors, for emigrants on the prairies, for traders who want small offices, and for many other purposes.

Application for a patent for this invention has been made through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the inventor at Paterson, N. J., or H. V. Butler, No. 13 Park-place, New York.

Tinning Cast Iron Articles.

When cast iron is coated with tin, its appearance is not only improved, but its surface is also prevented from rusting. To tin articles of cast iron, such as nails, parts of saddlery, &c., scour them thoroughly in dilute muriatic acid with sand until their surface is quite bright. Now wash them well in hot soft water and dry them with warm sawdust; then plunge them for a few seconds into a bath of molten tin, in which they should be kept in motion. They may next be taken out and cooled, when their surface will be found covered with a coat of the tin. The great secret in tinning articles of iron in a proper manner, is to have their surface perfectly free from oxyd when placed in the molten tin.

Saucepans and other hollow ware of cast iron may be coated with tin inside by scouring their inner surfaces, heating them slightly over a fire, then pouring into them some molten grain tin, which must be rolled about by moving each vessel until the interior is perfectly coated with the tin. The excess of tin is then poured out. Vessels of copper and brass, such as tin kettles, may be tinned in the inside in the same manner as cast iron vessels.

Articles of brass and copper, boiled with a solution of the stannate of potassa or soda, containing some chips or fine grain tin, will become coated in a few minutes with a layer of pure tin.

THE common charge for a 6-pound round shot is 1¼ lbs. of coarse powder. Cake porous powder is now preferred to the old large grain powder for artillery. The motion of a round shot in a cannon is a series of angular bounds from the breech to the muzzle.

Census Statistics.

The subjoined tables, prepared from the returns of the Eighth Census (1860), will possess interest for all our readers at the present time:—

WHITE MALES BETWEEN THE AGES OF 18 AND 45, INCLUSIVE, CENSUS OF 1860, IN ROUND NUMBERS.

STATES.		STATES.	
Alabama	106,000	Oregon	10,000
Arkansas	65,000	Pennsylvania	581,000
California	76,000	Rhode Island	35,000
Connecticut	92,000	South Carolina	60,000
Delaware	22,000	Tennessee	167,000
Florida	16,000	Texas	84,000
Georgia	119,000	Vermont	63,000
Illinois	342,000	Virginia	221,000
Indiana	270,000	Wisconsin	155,000
Iowa	135,000		
Kansas	21,000		5,433,000
Kentucky	186,000		
Louisiana	75,000	TERRITORIES.	
Maine	125,000	Colorado	6,000
Maryland	120,000	Dakotah	1,000
Massachusetts	246,000	Nebraska	6,000
Michigan	150,000	Nevada	1,000
Minnesota	32,000	New Mexico	13,000
Mississippi	71,000	Utah	8,000
Missouri	211,000	Washington	2,000
New Hampshire	65,000	District of Columbia	14,000
New Jersey	134,000		
New York	778,000		51,000
North Carolina	132,000		
Ohio	468,000	Aggregate	5,484,000

It will thus appear that in the free States there are 3,778,000 white males between the ages of 18 and 45, and 1,655,000 in the slaveholding States.

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